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A MONTHLY JOURNAL DEVOTED TO THE

DISEASES OF INFANTS AND CHILDREN

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EDITORIAL.

SOCIAL SERVICE AND MEDICAL WORK.

To those who believe that, in the last analysis, medical success is determined by the degree in which disease is prevented, and that the physician's highest aim is to make physicians unnecessary—far toward the millennium as that must be—every step in this direction is as welcome as the hand-clasp of a friend. And to everyone who has this point of view must come, sooner or later, the conviction that only by broad coöperation between medical men and workers in all fields of civic betterment can anything truly big be accomplished. Then, if he experience the weary efforts to help people to help themselves, the ponderous inertia of ignorance, the suspicion as for Greeks bearing gifts, which even coöperative private effort encounters, he will realize that much which needs to be done to make people well and happy must be done with authority by the State or city government. The medical inspection of schools, the care of contagious disease, the dispensary treatment of tuberculosis, as carried on by municipal control, have proved themselves to be necessary and beneficial. To these, other functions such as the care and feeding of infants in milk stations, are being added, and it is not a far cry to the time when adequate medical treatment for the poor shall be possible, as it is in Germany, through extension of the functions of government. To some in the profession, the encroachment of health department activities upon the practices of those whose patients are the very poor has seemed unjust and menacing. Societies have been formed to protest against such socialistic tendencies and to "protect" the practicing physician. Alas, that anyone should undergo the drudgery of medical study and work and because of insufficient income be denied the satisfactions of medical life! Yet such organizations which, like Canute the Dane, think to hold back the sea of greater and freer medical service to the poor are destined to failure, soon or late. It is pretty generally true that when it is a question of human welfare or happiness or health he who harks back to the rights of the individual as opposed to those of the multitude shouts into the wind. Sometime he must come to see that the true welfare of the individual is obtained in proportion to the success with which the welfare of all is secured.

One of the most potent factors in bringing better medical service and better results to those whose poverty makes them the recipients of hospital and dispensary treatment is the alliance between the physician and the social worker. Beginning in 1905, at the Massachusetts General Hospital, largely through the effort of Dr. Richard C. Cabot, whose dissatisfaction with then existing ineffectiveness of hospital treatment gave him the vision of a better state of things, the idea that an institution which treats its patients with medicine alone does but half its duty has come to have wide fruition in the social service departments established broadcast in a hundred American cities.

In this work Miss Ida M. Cannon, now head social worker at the Massachusetts General Hospital, has borne a large and, no doubt, a wholesomely satisfying part. Anyone who has heard Miss Cannon speak of the need of social work to supplement and render more efficient the purely medical work of the results which have been accomplished in Boston and of the future toward which social service is striving, cannot but realize the true humanity and the essential economy of such effort, and seeing her enthusiasm become enthusiastic likewise. That Miss Cannon has been persuaded to put her experience into book form is a matter of congratulation to all of us, for no one can write with greater authority on the subject, and few books will be permeated with more lofty ideals or a clearer insight into human nature's daily needs than this beautifully written volume of hers.*

Physical and social ills go hand in hand, and often it is the social difficulty which must be the first relieved. The tuberculous wage-earner cannot begin his cure until means have been found to take care of his dependent family. A tonic will not raise the hemoglobin index of a woman who has not enough to care for herself and her child. It is truly absurd, as Miss Cannon says, to expect results from the use of a back brace when the patient, suffering from pernicious anemia, is starving herself to pay for it; nor is it economy for an institution to distribute $250 over a period of two years in medicine and treatment upon a family afflicted with scabies without getting any result when a week of following up by a social worker serves to effect a cure in eleven individuals.

Medical practice without an interest in one's patients does not repay the effort. Private practice has the social interest attached to it inevitably. In private practice consideration is always given to personalities, likes and dislikes, financial circumstances, etc., in prescribing treatment. Upon this, in large measure, depend the success and the extent of a practitioner's work. The same principle applies to institution work. If a dispensary dispenses medicine only the patients may return, because, being poor, they must; but the results are incomplete and unsatisfactory. The union of social worker and physician makes possible the carrying out of such a principle.

---

* "Social Service in Hospitals," by Ida M. Cannon, R.N., Headworker, the Massachusetts General Hospital. The Survey Associates, Inc., 1914.

In Baltimore and Indianapolis social work has been made a part of the medical students' training, and those who have been fortunate enough to have this in their course know better than they could otherwise how complex is the *art* of healing.

In the attempt which we are all making toward the prevention of tuberculosis, of syphilis, of gonorrhea, the lowering of infant mortality, the prenatal care of infants, the solution of the problem of the unmarried mother, the relief of industrial diseases, social workers are quite as essential as medical workers. They gather up the loose ends of facts, carry out the details of medical treatment, supplement this with relief, or advice, or employment; make the spirit of service one of the qualities of the hospital or dispensary.

To all who have worked without and with social service in hospital and dispensary the alliance is one which will not willingly be broken. By it new efficiency, new interest and new enthusiasm have come, and unequalled satisfaction.

EDITORIAL NOTE.

We reprint from the *Medical Record* two excerpts which struck our attention—one because of the wholesome sentiment which we wish to pass along; the other because of its interesting point of view regarding the tonsil. We would make apologies to the *Record* for thus "lifting" them entire, did we not feel that the act is an evidence of our respect and agreement.

ORIGINAL COMMUNICATIONS.

CASES OF EDEMA IN INFANTS.*

BY HENRY DWIGHT CHAPIN, M.D.,
New York.

It has long been known that local and general edemas, not due to nephritis, are occasionally seen in early life, but the causes of this condition have been variously explained. It may thus be of interest to report a series of cases in which various symptoms were noted and studied in their relation to the edema. As some of these cases were accompanied by slight albuminuria, it may be well to recall that any marked bodily disturbance in the infant is apt to show some abnormalities in the urinary findings, such as occasional traces of albumin, and even a few hyalin casts.

Some years ago, the writer reported examinations of the urine in 86 cases of mild and severe gastrointestinal disturbance, and small amounts of albumin were found in 75 of them; and in a series of 57 cases of pulmonary diseases, traces of albumin were noted in 49. Other observers have called attention to the same condition. This cannot predicate the presence of actual renal disease, but, rather, an irritation of the renal tubules accompanying a slight congestion and having no special significance. Attention is here called to this fact, in order to emphasize the point that edema in infants is not to be considered as due to nephritis simply because small amounts of albumin are found in the urine.

We must try to differentiate a little more in this class of cases. It will doubtless be found that the causes are often complex and due to a combination of a number of abnormal conditions.

A clinical study of 21 cases gave the following data:—

Age of Cases.—One, sixteen days; two, five weeks; one, seven weeks; one, two months; three, three months; one, three and one-half months; two, four months; two, six months; two, eight months; two, one year; two, two years; two, three years.

Condition of Infants.—One was premature, twelve had malnutrition with digestive troubles, two were apparently healthy, two had bronchopneumonia, one had pericarditis with effusion, two had otitis media and one had cerebrospinal meningitis.

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* Read before the Annual Meeting of the American Pediatric Society at Washington, May, 1913.

Location of Edema.—In four it was general, two of which were preceded by a maculopapular rash; in seven the ankles and feet were involved, two had involvement of the face only, in one the right knee, left hand and left forearm were affected, in two both feet and hands, in one both wrists, in two the face and both feet, in one the face and abdomen, and in one the scrotum and penis.

Blood Examinations.—In 12 cases the blood was examined, 6 of which showed mild, secondary anemia, with differential counts right. Three showed normal, or high red, blood count, 5,800,000, 6,800,000, 5,000,000. In no case examined was there any evidence of pernicious or profound anemia, except, possibly, one that gave a very poor showing, *i.e.,* reds, 1,900,000; hemoglobin, 85 per cent.; whites, polymorphonuclears, 48 per cent., and lymphocytes, 52 per cent. However, there were no nucleated reds, megalocytes or microcytes and no poikilocytosis. The examinations in these cases showed no more blood disturbance than in similar types of illness without edema.

Condition of Stools.—Twelve were abnormal, seven were fair, and two unaccounted for.

Condition of Urine.—In 19 cases the urine was examined with the following results: Albumin was present in faint traces in 9 cases and heavy trace in 1 case. It was absent in 9 cases, and sugar was not found in any of the specimens. Seven of the specimens examined showed occasional casts, five of them hyalin and granular, and two with hyalin casts. The rest of the examinations never showed even occasional casts of any kind. One case showed pus, and 1 had the phenolsulphonephthalein test applied with 55 per cent. return, although there was a slight leakage.

Weight of Infants.—Three gained in weight while under observation, eight remained stationary, eight lost in weight, and in two the weight was not noted.

The duration of the edema in these cases varied from three to twenty-one days. There were seven deaths, three from malnutrition, two from bronchopneumonia, one from cerebrospinal meningitis and one from pericarditis with effusion.

A few individual cases will be cited as fairly typical of the series:—

CASE I.—Healthy baby of sixteen days. Weight, seven pounds, eleven ounces. Swelling of the left hand and forearm and right knee. Baby was in hospital for fifteen days, and the condition remained unchanged on discharge. The blood showed hemoglobin, 85 per cent.; reds, 5,800,000; whites, 14,600; polymorphonuclears, 53 per cent.; lymphocytes, 47 per cent.; Wassermann, negative. The urine showed no albumin, casts nor sugar. Half an ounce of fluid was obtained from the right knee by aspiration, which showed no growth culturally. Guinea pig injected and lived.

CASE II.—Premature baby of seven and one-half weeks. Weight, three pounds fourteen ounces. Edema general, preceded by maculopapular rash. Duration, six days. Stools frequent, green and watery. Blood showed marked anemia of the secondary type. Three examinations of urine were made during the attack, showing faint traces of albumin and a few hyalin casts. The baby left the hospital in good condition, with urine normal.

CASE III.—Pericarditis with effusion in a baby of two years. Edema started in both feet, lasting, off and on, for three weeks. Before death, the edema affected the face, but no other part. The temperature was high and irregular, and the stools loose and frequent. Two examinations of the blood were made. (1) Hemoglobin, 75 per cent.; reds, 4,000,000; whites, 26,000; polymorphonuclears, 75 per cent. (2) Hemoglobin, 64 per cent.; reds, 3,800,000; whites, 16,000. A culture of the blood showed pneumococci. The urine showed traces of albumin, with hyalin and granular casts. Later on, the results of the urinary examinations were negative. The baby died from exhaustion.

In a study of these 21 cases, it seems that neither the condition of the blood nor urine can satisfactorily explain the edema. While the exact cause, or causes, may be obscure in a given case, I believe, in the present state of our knowledge, we can make a rough classification of the kind of cases that are apt to show this phenomenon.

1. Difficult digestion and mal-assimilation. Diarrhea can produce toxins that may induce vasomotor paralysis. Twelve of my cases had intestinal disturbances, shown by abnormal stools. Dr. W. E. Hume (*British Medical Journal,* September 2, 1911) has reported 13 cases in which general edema followed gastroenteritis in infants and young children. Neither

albumin nor tube casts were found in the urine in any case. In 8 of the cases in which the blood was examined, some degree of secondary anemia was found. Two of the cases died, and both showed abnormal fibrosis in the suprarenal glands, and the author suggests future study of these glands in this connection. Another theory is that the condition may be due to retention of salts in the tissues, particularly sodium chlorid and the phosphates, but Hume, in observations on 2 normal cases and 2 of edema, failed to discover any difference between the salt exchange in cases suffering from this variety of edema and that which takes place in perfectly normal children. These edemas, with intestinal disturbances, are probably somewhat analogous to the urticarias.

2. Edema is seen in various exhaustive conditions, such as prematurity, marasmus, extreme secondary anemias, edema neonatorum and in long debilitating diseases.

3. In various constitutional diseases, such as syphilis, tuberculosis, erysipelas, pertussis, etc., edema is an occasional accompaniment.

4. Angioneuroses of vasomotor origin will explain the phenomenon in certain instances. Two of my cases were evidently of this nature.

It would seem as if the kind of edema here described would form an interesting subject for future and collective study.

VULVOVAGINITIS IN CHILDREN.—Edith Spaulding (*American Journal of Diseases of Children,* 1913, No. 3, p. 248) believes that all such cases with a persistent discharge are primarily gonococcal. The disease may last for many years, with long periods of latency, and may show any of the complications seen in adults. A permanent cure cannot be guaranteed. She recommends douching with boric lotion, followed by the instillation of a 25 per cent. argyrol solution, combined with vaccine treatment, the combination producing steadier improvement than local treatment alone. The risks involved in allowing douching to be done at home or indeed in hospital are not mentioned, and form a strong objection to this method. (See *Universal Medical Record,* February, 1913, p. 156, No. 1,141.)

REPORT OF A CASE OF RABIES.*

BY ALFRED HAND, JR., M.D.,

Philadelphia, Pa.

When it falls to the lot of one observer to meet in three years with two instances of an infectious disease so rare that there is, or was, doubt in the minds of some as to its existence in human beings—the other case reported elsewhere (Hand, White and Reichel, "Report of a Case of Hydrophobia," *Journal American Medical Association,* March 29, 1913) being the first in which the diagnosis was accepted by the Coroner's Office in Philadelphia County—it is but natural for that observer to feel that the disease is on the increase. In view of the mortality, almost 100 per cent., but one recovery of a doubtful case having been reported, it would seem equally clear that rigid preventive measures should be instituted.

J. R. P., nine years old, made his first visit to the receiving ward of the Children's Hospital of the Mary J. Drexel Home on December 18, 1912, when he was brought in by the Police Patrol shortly after he had been severely bitten in the face by a dog. The resident physician, Dr. Shoudy, to whom I am indebted for some of the notes made subsequently, described the lacerations as being, one at the right angle of the mouth, another through the right ala of the nose, a third at the right angle of the nose and a fourth in the middle of the forehead. Bleeding had been profuse. Pure carbolic acid, followed by alcohol, was applied, a loose stitch taken at the angle of the mouth and the wounds were covered with gauze wet with 1 to 1,000 bichlorid solution. He was then taken home by the patrol, with instructions to return on the following day. At that time, the wounds were highly inflamed, considering the time that had elapsed, with far more reaction than Dr. Shoudy had ever observed to follow a dog-bite. The boy, when questioned, stated that his jaws hurt him and that it had been difficult during the night for him to swallow. His mother was then informed of the danger of hydrophobia, and was urged to leave him in the hospital for the Pasteur treatment. As she refused to do this, the hospital declined to have further responsibility of the treatment. His mother then stated that she would see the family physician and be guided by him, but when Dr. Shoudy telephoned to him, three days later, the boy had not been taken to him.

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* Read before the American Pediatric Society, Washington, D. C., May 6, 1913.

The next that was seen of the patient was on January 15th, when he was brought by his father for treatment of an abrasion of the scalp from a fall while playing in the street. The Pasteur treatment was again urged, but the intoxicated parent could not see the necessity of it "for such a strong boy."

On January 29th the boy complained of not feeling well and was drowsy. The next morning he had headache and pain in the throat; at 10 A.M. he was suddenly seized with what the mother said was a convulsion, but he did not lose consciousness, for, during it, he told her that he felt that he would die. His mother also said that his face became very red and he went "mad." A physician was called, and, with the father, took the boy in his carriage to the hospital at 3 P.M., the boy walking into the receiving ward. On being informed over the telephone of his arrival, I directed that he be given morphin ¼ grain, hypodermatically, and be placed in a small room by himself, with his fingernails covered, so that none of the attendants might be accidentally scratched; basins with bichlorid solution were placed in the room, so that all who handled him could disinfect their hands at once.

On my first visit to him, at 4 P.M., he presented a never-to-be-forgotten picture, as he tossed around in the bed, lying down, sitting up, jumping from side to side, never still for a second, his face flushed a bright red and the pupils of his eyes widely dilated, giving to his face the characteristic hunted expression of rabies. There was an evident spasm of the pharynx, for the saliva, which flowed profusely, could not be swallowed, but was spat out at intervals of a few seconds with a gagging sound which could only by the wildest flight of the imagination be said to resemble the barking of a dog. The saliva consisted of small, sticky pellets, floating in a watery secretion, which filled a pus-basin in a few minutes. As the morphin had had no effect, it was repeated, and with the hope of relaxing the pharyngeal spasm, or, at least, of relieving its painful feature, of which the boy complained bitterly, a cocain solution was sprayed into the nasopharynx. The effect of this was immediate in causing the gagging sound to cease, and the boy, becoming less restless, sat up and said: "Oh, give me a drink of water!" A medicine-glass, full, was handed to him and he reached eagerly for it, showing that the name hydrophobia is sometimes a misnomer (a possible explanation being that children are slower to appreciate that attempts at swallowing increase the painful pharyngeal spasm, and so do not dread the attempt, or even the suggestion, of swallowing caused by the sight of a glass of water, as adults affected by the disease are said to do); he took a mouthful, closed his lips for a few seconds in a vain attempt to swallow, and then expelled it forcibly with a cry which had a note of regret in it. His temperature at this time was 106° F. Immediately after his admission, an attempt to give him a sponge bath was unsuccessful, because of the intense excitement it produced, apparently mental, as well as physical, for he talked rapidly and disconnectedly, with frequent expressions of fear that he would be hurt.

Physical examination was almost impossible, owing to the fact that when he would become quiet momentarily, a touch would be enough to start up the wild restlessness again, but it was finally determined that the lungs were clear and that the heart-sounds were valvular, the pulse-rate being 200 per minute.

At my next visit, two hours later, in company with Drs. Griffith and Gittings, he was able to tell his name when asked, and in reply to the question if he had pain, he would put his hand to his throat and clench his fingers. By this time, it had become necessary to restrain him by a sheet across the chest, but this only limited the muscular activity, which kept up for another hour, periods of quiet becoming longer and a touch not interrupting them so easily. Dr. Griffith spoke of a certain resemblance in the high fever and muscular restlessness to grave chorea, but noted the difference in the mental states and in the presence of frothing at the mouth, the boy having ceased his acts of spitting and the saliva flowing out of the corners of the mouth. At 7:30 P.M. Dr. Shoudy noted free perspiration, pupils responsive to light and less widely dilated; breathing hard, with increased tactile fremitus on the left; heart-action slower; not so easily excited, but a sudden tap causing a general muscular contraction; convulsive movements still occurring with arching of the back and stiffening of the neck; does not reply to questions.

At eight o'clock the parents called and took the boy home, where he died fifteen minutes after his arrival.

Upon the invitation of the coroner's physician, Dr. Wadsworth, I accompanied him to the home on the following day, but parental objections to an autopsy could not be overcome for three days. The material finally obtained was taken to the Laboratory of the State Livestock Sanitary Board, where it was examined by the Director, Dr. Karl F. Meyer. His reports are as follows:—

February 5, 1913.—Report on Specimen No. 3273, received February 3d, consisting of the brain of a boy: A microscopical examination of sections of nerve tissue showed one ganglion cell containing three Negri bodies. Animals have been inoculated with an emulsion of this material.

February 27, 1913.—Final report on Specimen No. 3273, brain of J. P.: One of the rabbits inoculated subdurally died subsequently and microscopic examination of sections of the hippocampus revealed Negri bodies in large numbers. The diagnosis of rabies can be made conclusively.

MALFORMATION OF THE RECTUM: OPERATION.—At the November meeting of the Royal Society of Medicine (Section for the Study of Diseases of Children—see *Proceedings,* December, 1912), Clogg showed an infant who, shortly after birth, was found to have an entire absence of proctodeum. Immediate colostomy in the left iliac region was performed. Six months later an exploration was made, from the perineum, and the bowel found to end blindly at the level of the prostate. From this it was separated, and brought to the perineal skin, without tension, and sutured. A portion of the coccyx was also removed and the colostomy was closed. The result is perfect, but the motions are passed unconsciously. The case illustrates the advantages of immediate primary colostomy in these cases, and the point that, in order to establish a perineal anus without stenosis, the bowel must be, as here, freely mobilized. Since the sphincters are developed from the proctodeum, such loss of sphincter control as is present in this case must be expected.

OBSCURE MANIFESTATIONS OF RHEUMATISM IN CHILDHOOD.*

BY JOHN ADAMS COLLIVER, A.B., M.D.,
Los Angeles, Cal.

The most pronounced early manifestations of rheumatism in childhood are obscure in the extreme if one is expecting to find adult symptoms. They are obscure and difficult and often impossible to detect, even with the ordinary childhood picture before you. These early symptoms are so slow, so insidious and progressive in character that even when fairly well developed they neither give the child discomfort nor the parents anxiety, and are discovered, as a rule, only by accident or when the patient is under observation for some other trouble.

IMPORTANCE OF SUBJECT.

If the disease causes so little disturbance, why is the detection of it so important? In England about 8 per cent. of the children are affected with rheumatism, while in the United States the percentage is much less. In an analysis of the records of 1,000 California boys at about puberty I found evidence of rheumatism in 5.2 per cent. All the percentages would no doubt be much higher if early detection were possible.

In over 90 per cent. of the children with rheumatism the heart suffers the most. Each attack predisposes to another. The liability to heart involvement decreases as age advances, but liability to subsequent attacks with more severe cardiac manifestations increases with advancing age. Our aim is to prevent these disastrous effects, and conserve the adult heart. Childhood and youth are the only periods when one can hope to successfully eliminate this condition, and this can only be done by beginning early.

DIFFERENCE BETWEEN RHEUMATISM IN CHILD AND ADULT.

Before taking up in detail the obscure manifestations of rheumatism in children it might be well to point out its relation to the adult. Contrary to the general rule, the onset is slow in the child, with few or no symptoms or temperature. In an adult the onset is usually ushered in by chill, high fever and general malaise. The disease in the adult is general, being similar to a toxemia, while in the child the condition is more localized and a number of foci appear. According to A. M. Grossage, in adults toxins are manufactured in the blood, while in children this occurs in the tissues. In the child there is no sweating, in marked contrast to the profuse perspiration of the adult. The articular systems in childhood are absent, fleeting, or so insignificant as to give rise, as a rule, to no discomfort, while in the adult they are the most prominent symptom, and are accompanied by redness, swelling and effusion.

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* Read before California State Medical Society, April 18, 1913.

In order to include and study all the early manifestations, I will, for convenience, take up the local, constitutional, nervous and cardiac symptoms, arranged according to increasing importance.

SORE THROAT AND TONSILLITIS.

The great majority of rheumatic cases have an early history of a series of colds occurring after dusty days followed by dampness. Much has been written of the rheumatic tonsil. According to W. P. S. Branson, Poynton, Payne and others, it has been shown by inoculation that the tonsils and nose are the portals of infection. Children subject to frequent attacks of tonsillitis and "sore throat" should be regarded as liable to the disease. Frederick Langmead, of London, in an analysis of 2,536 children, found tonsils sufficient to warrant operative interference four times as frequently in rheumatic children as in those without such history. Occasionally acute attacks of rheumatism are ushered in by tonsillitis, and show endocarditis without evident articular symptoms.

ARTHRITIS AND GROWING PAINS.

Growing pains in children have long been a common phenomenon and considered as a necessary part of a child's development. They are of such a character that they are usually easily forgotten. Boys describe the condition as "a shooting pain and gone." Often it is only a stiffness. It may be manifested only as tender heels, or stiffened hamstrings, or lumbago.

Definite arthritis has been left until the last because for early diagnosis it is not of primary importance. The game is well on when arthritis is severe enough to cause parents to take notice. "Stiff neck," however, is another variety of the same thing, and when preceded or accompanied by tonsillitis or sore throat is a very early symptom and characteristic of rheumatism. This paper deals with early symptoms, so I will not consider arthritis in detail.

NODULES.

Nodules are occasionally associated with rheumatism. They are usually felt on tendons and over bony prominences. They may come and go, and when present the case is fairly well advanced. Lewis Smith, of the London Hospital, says their presence is always a "danger signal," and "spells almost certain heart trouble, past, present or future." English writers consider them more common than Americans. I have found them but twice in California, and very few times in New York clinics. Dr. R. O. Moore, of London, says there are nodules in 10 per cent. of the cases of rheumatism in children. Poynton considers the nodules "pictures in miniature of the rheumatic processes in children."

J. R. Clemens believes that enlargement of thyroid precedes all manifestations. I am sure this is not true of all boys. When found, a close inquiry into the past history, and a careful examination of the heart, should be made, and the patient kept under observation.

CUTANEOUS MANIFESTATIONS.

An erythema similar to scarlet fever, first observed by Cheadle, has been noted. I have seen it appear as transient blushes near large joints. These eruptive symptoms together with purpura are rare, interesting and fleeting, and generally found when a diagnosis can be readily made without them.

I have lately observed as an accompaniment of the early stage of the disease crops of small pin-point eruptions. These usually appear on palmar surface of the hands or feet, affecting chiefly the toes and tips of the fingers and appear in crops of from 7 to 15, covering an area from the size of a dime to a half-dollar. The first objective symptom of this eruption is itching, later white pin-head papules appear, which can usually be felt before they are seen. These afterward develop into minute blisters, which finally desquamate. This entire period usually lasts from three to seven days. No writer, as far as I can find, has ever described this pre-desquamation stage, which may be another link in the similarity between rheumatism and scarlet fever.

Constitutionally and physically, patients with true rheumatic disease often look well and take on flesh, but as the disease develops there appears the peculiar pallor or anemia referred to by Holt. It is accompanied by a fall in red and increase in white corpuscles, and a murmur, possibly hemic.

OBSCURE FEVER.

One of the earliest and most constant and obscure symptoms of rheumatism in children is the persistence of a low fever, dropping daily to normal, occasionally below, and seldom going above 100°F. The child usually feels well, looks well, and the condition is only accidentally discovered. The first suggestion occurs after an illness, during which time there has been elevation of temperature, but as the other symptoms clear up the temperature chart reveals the persistence of a small amount of unaccountable fever. At this time a complete examination may disclose no other symptoms further than slight acceleration of the heart on exertion, with no signs in the chest. One naturally thinks of tuberculosis, but gets a negative von Pirquet. Corwan and Miller, of London, referred to this condition as the "mysterious temperature." Later it was observed by Poynton, who considered it a very important diagnostic symptom of very early infection. He cites cases which were diagnosed early as tuberculosis. Many of us have had similar experiences. During the persistence of this "mysterious temperature" you can daily examine the patient, who under greatest difficulty is kept in bed, and watch the slow evolution of the disease unravelling symptom after symptom until the heart involvement, which will be described later, appears.

NERVOUS SYSTEM.

The growing unstable nervous system of the child exhibits very early the influence to the toxins of rheumatism. With this there is generally a rheumatic or neurotic family history. Such a child is usually nervous, easily frightened, and extremely irritable, jerking and starting in sleep, with "night terrors," etc. Later the spasmodic contractions of voluntary muscles appear, and often develop into a typical chorea.

IRRITABILITY.

One of the earliest manifestations of rheumatism on the nervous system is irritability. My attention has several times been called to children in whom this symptom was the only one noticeable. Parents have brought children to me because they took spells of being mean—crying without apparent cause, throwing toys, making faces, saucing mother, etc. In making examinations I have discovered evidence of rheumatism, and the irritability cleared up with rest and antirheumatics. I believe all cases exhibiting an unaccountable, irritable temper, etc., should be thoroughly examined. W. P. S. Branson mentions a nervous irritability due to the poison on the specifically predisposed central nervous system, which may precede the appearance of choreic movements by some weeks. I wish to emphasize this point, as I believe irritability one of the earliest manifestations of rheumatism in children.

CHOREA.

All authors agree that there is a very close relation between rheumatism and chorea. Some investigators believe they have demonstrated them as due to the same organism. The work of Mark S. Fraser in analyzing 300 cases of chorea, extending over a period of twenty years, shows that there is either a personal or family history of rheumatism in 90 per cent. of the cases. He concludes that possibly all cases of true chorea are rheumatic in origin. Osler says: "There is no disease in which postmortem endocarditis has been found so frequently as in chorea." Fifty-six per cent. of Holt's cases of chorea were associated with rheumatism, but this includes only the articular variety. The percentage would be very much higher if, as he suggests, endocarditis were included. Still thinks children may have chorea for months, or even a year or so, before other rheumatic manifestations appear. Carey Coombs described a chorea due to excitation of cortex, induced by the microörganisms or toxins of rheumatism. Endocarditis is by far the most frequent lesion of chorea, and is believed by some to be caused by originating small emboli which lodge in the cerebral cortex.

The early symptoms of this disease may at first be nothing more than lack of coördination, manifested by awkwardness, etc. I have felt that a certain variety of stammering which accompanied this symptom was due to the same thing. I have seen the two go hand in hand, preceding the development of chorea and later rheumatism.

Shock is considered by some as necessary to precipitation of chorea. These cases are usually nervous, and a history of fright is easily obtained. The heart at times is disturbed. I have seen cardiac intermittency and extra systoles accompany the severest movements and subside with them. Aubertin and Parvu report a case where the myocardium seemed to participate in the choreic movements.

CARDITIS.

The most important feature of rheumatism in children is the relation it bears to the heart. All of its manifestations are important because of their influence on this organ. The heart involvement is a part of the disease, and not a complication. It may attack the endocardium, myocardium, or pericardium, or all of these. The latter is usually a late symptom, and will not be considered here.

ENDOCARDITIS.

The most obscure symptom of rheumatism is endocarditis. It is present in 90 per cent. of the cases in childhood. In the beginning it is absolutely impossible to detect. We can only infer its presence by close observation, wait, and afterward watch its development. One can easily appreciate this when he considers that the first effect of the toxin or microörganism is to produce endothelial degeneration of the valves, resulting in formation of very small nodules. It is impossible to detect the presence of these at first with the stethoscope, and many cases go to postmortem before being discovered. The first reliable symptom, however, of their presence is a change in heart rate or rhythm. It may be rapid and irregular in the beginning. The earliest sign, I have observed, has been an intermittency, which increases later into irregularity, followed soon by roughening of the first sound. A double mitral movement is, according to Poynton, the only reliable symptom of endocarditis. Herz, of Vienna, reported an epidemic of endocarditis, with moderate fever, and without angina or joint symptoms.

MYOCARDITIS.

The toxin, one product of which is said to be formic acid, has a very marked relaxing effect upon the cardiac muscle, leading to loss of tone and dilatation of the chambers. The sphincters around the mitral and tricuspid valves may likewise be affected, causing their relaxation and thus allowing regurgitation. Authorities differ as to which symptoms appear first—endocarditis or myocarditis. This much is agreed: The earliest manifestations of each are the same, being, as mentioned before, first a change in cardiac rhythm, soon to be followed by change in the sounds. Accompanying this we have signs of dilatation, namely, increased cardiac dullness, displacement apex beat to left. The first sound is short and blurred, with or without definite murmur, with usually an accentuated pulmonic at the base. Occasionally there is pain, but when present this is frequently referred to the epigastrium. This dilatation is functional, and with proper rest and attention will disappear.

It is impossible to make an early diagnosis by signs of the heart alone. There are other infections which may produce a carditis and simulate the symptoms mentioned. It is impossible to diagnose in this stage by any one symptom or a single examination. The progressive character must be considered. As Burney, Yeo and Arthur G. Phear say, the only criterion of diagnosis in these cases is the "course of events."

Even when well established, they are more often overlooked than wrongly diagnosed.

Remember, rheumatism in children is most insidious, most deceptive, most easily overlooked, most difficult to manage, and most disastrous to the heart.

Laughlin Building.

THE TREATMENT OF RINGWORM OF THE SCALP.—Garrett, of Cheltenham, in the *British Medical Journal* for February 22, 1913 (p. 390), calls attention to a method of treating ringworm of the scalp that he has devised: The strong solution of perchloride of iron is applied with a brush, until the scalp is well stained by it, every second day for six days, and then every third day for eighteen days. At the end of this time a cure is generally found to have been effected. In the beginning the hair should be cut short over the affected places, the scalp well washed, and then cleansed from grease by the use of motor spirit. The head should not be often washed during the treatment. The application has no ill effects, and it does not appear that it need be too scrupulously confined to the areas obviously implicated. Garrett finds that the results of this treatment surpass any other that he has tried.

EXPERIENCES WITH "WHEY MODIFIED MILK" IN INFANT FEEDING.*

BY JEROME S. LEOPOLD, M.D.,

New York City.

In 1912 E. Schloss, of Berlin, reported the results of a method of infant feeding administered to a large number of infants, the great majority of whom were under three months of age. These infants were brought up on the milk mixture devised by Schloss, a mixture resembling human milk very closely. It was termed "whey modified milk," because especial attention was given to the modification of the salts contained in the whey.

In the monograph which he wrote on the subject (*Uber Säuglings Ernährung,* S. Karger, Berlin), Schloss pointed to the fact that in feeding infants, and especially young infants, breast milk is unquestionably the food of choice. It is very well known, however, that breast milk is at times very difficult to obtain. Buttermilk, malt soup, and the Finkelstein and Meyer "eiweissmilch" have been used to replace breast milk in a very large number of cases with excellent results. Although these latter mixtures have done excellent service as curative agents in the various nutritional disturbances of infancy, they have not been very satisfactory according to Schloss's observations when employed for prolonged periods. (Daŭernahrung).

According to Schloss the chief reason infants do not thrive as well on cow's milk as on human milk is not because the proteid, or the fat, or the sugar is different, and easier to digest in human milk than in cow's milk, but rather because the percentage and the concentration of the salts are different in the two milks.

In order to obtain a milk that will be as easy to digest as human milk, not only the proteids, fats and sugars, but also the salts must be similar to and in the same concentration as those of human milk. In other words, Schloss endeavored to modify cow's milk so that it would be similar to human milk in every respect.

With this end in view Schloss devised the following modification of cow's milk. To make one liter of the mixture the following ingredients are used:—

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* From the Hebrew Infant Asylum of New York City. Service of Dr. A. F. Hess.

20 per cent. cream	140 c.c.
Full milk	140 c.c.
Water	700 c.c.
KCl	0.2 gm.

This mixture has the same percentage of salts and fats as human milk, but less proteid and less sugar. To make up for this deficiency, casein is added in the form of nutrose or plasmon, and sugar is added in the form of a dextrin and maltose preparation, because it has been shown that this preparation of sugar is better borne than milk or cane sugar. Schloss first tried milk sugar in his modification, but his results were not nearly as good as when dextrin and maltose were added. Furthermore, Schloss observed that his young infants made better progress if a small amount of flour was added to this mixture. Two mixtures were made, one containing flour, and one without flour. The mixture with flour is used for infants under three months, and is called mixture "A." The mixture without flour contains more sugar than mixture "A," and is used for infants over three months of age. This mixture is called "B."

MIXTURE "A."

For infants under three months.

20 per cent. cream	140 c.c.
Full milk	140 c.c.
Water	700 c.c.
KCl	0.2 gm.
Dextrin and maltose	35 gms.
Flour	15 gms.
Nutrose or plasmon	5 gms.

MIXTURE "B."

For infants over three months.

20 per cent. cream	140 c.c.
Full milk	140 c.c.
Water	700 c.c.
KCl	0.2 gm.
Dextrin and maltose	50 to 70 gms.
Nutrose or plasmon	5 gms.

If flour is used, it must be boiled with the sugar, casein preparation and water for fifteen minutes. If no flour is used, the mixture is simply brought to the boiling point.

The "whey modified milk" that has been described above was administered by Schloss to 200 infants for a period approximating one year. About half of these cases were under one month of age, and the remainder were chiefly in the second month of life. The youngest infant was eight days old. *None of the cases fed on this "whey modified milk" died from any nutritional disturbance.* One died of empyema, and one succumbed to a grippe infection.

According to Schloss, all the infants took this feeding very well. The stools were, as a rule, yellow, homogeneous, and of a pasty consistency. The reaction was usually alkaline. At times, when the stools were dyspeptic on breast-feeding, changing to this "whey modified milk" resulted in normal stools. Vomiting was rarely observed, although this food contains a rather large percentage of fat. If vomiting occurred, it was easily cured by giving more frequent feedings—seven or eight, or even more, instead of six in twenty-four hours. The infants showed a degree of physical development which in institutional children, at any rate, is only seen among those who are breast-fed. In addition, their sleep, color and muscular tone was all that could be desired.

Although more than a year has elapsed since Schloss has reported these very favorable results with his "whey modified milk," no further contributions to this subject have appeared by other observers, either abroad or in America.

For this reason, it appeared to me that a report of my observations might be of value, although I have been using "whey modified milk" in only 30 infants during the past year: Owing to an error in our diet kitchen during the first period of my observations, a mixture which contained a higher percentage of fat than recommended by Schloss was used.

I shall reserve for a future report a complete record of my cases; in this contribution, I shall present very briefly a summary of the results observed.

My cases, like Schloss's, were all institutional infants. The ages varied from eleven days to thirteen months. All but eight of the infants were under six months of age. All of the cases remain under observation.

In the first place, it can be definitely stated that "whey modified milk" is a harmless mixture. In none of my cases was the condition of the infant made worse by this feeding. No deaths resulted. In some cases, and especially in infants over six months of age, at times it was impossible to induce a gain in weight with this feeding. These older infants remained well in every respect, but for some unknown reason no increase in weight could be obtained. In some of these instances, a gain in weight resulted as soon as a simple milk mixture was substituted for the "whey modified milk."

On the other hand, "whey modified milk" seems to be especially indicated in very young infants when breast milk cannot be obtained. Infants take this feeding very well, and, as a rule, have alkaline, yellow, pasty, homogeneous stools, as described by Schloss. Gain in weight is usually observed, if no intercurrent disease, as, for instance, "grippe," is present.

From my observations, it may therefore be concluded that very good results can be obtained in young infants with "whey modified milk," as recommended by Schloss. This mixture is especially useful in institutions in which breast milk is not obtainable, or is obtained with great difficulty.

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ON TRACHEAL COUGH.—Buch, of Helsingfors, recommends the following procedure for the diagnosis of tracheitis (*St. Petersburg. med. Zeit.*, January 15, 1913). Pressure is made by the fore and middle fingers over the manubrium sterni on the trachea; or the finger strokes the trachea up and down. Healthy persons do not react to this stimulus; children or adults suffering from tracheal cough will have forthwith one or more fits of coughing. This form of cough is usually dry, is frequently of long duration and the patients often complain of a tickling sensation in the throat. In 3 cases of whooping-cough Buch has found the same reaction to pressure and believes this may be often an aid to early diagnosis—especially in out-patient work. This reaction never fails to differentiate tracheitis from bronchitis. The best treatment is local—an injection of a few drops of some astringent or disinfectant directly into the larynx.

BREAST FEEDING.*

BY ELEANOR C. JONES, M.D.,
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There has come about in the last decade a veritable renaissance in the insistence of physicians on the value of breast milk. This has followed as a natural reaction from the previous too high valuation placed on the "exact percentage feeding" idea. The brilliant work done by Rotch and his colleagues in percentage feeding in the '90's seemed almost to solve the question of infant feeding, and, as a consequence, physicians became less insistent on maternal nursing.

But the continued high mortality of bottle-babies from dietetic disorders, and the development of many dyscrasias in later life, soon made us realize the folly of trying to supersede nature's way.† The reaction began in the early years of this century, when here and there was raised a voice urging that the coming generation would only become healthy and blooming when all efforts should be directed toward making feeding by mother's milk generally possible. Soon, through research and clinical observation, evidence began to collect regarding the true value of mother's milk. At the present time the general opinion seems to be that about 7 babies die that are bottle-fed to 1 that is breast-fed.‡

There are certain well-marked differences between cow's milk and human milk that show some of the reasons why cow's milk cannot entirely displace human milk. The recent experiments of Moro and Gregor show that cow's milk and human milk act very differently on the human digestive tract; an examination of the blood of infants showed a leukocytosis after the ingestion of cow's milk, while the blood of breast-fed babies, at the height of digestion, showed a leukopenia. It has also been found that each particular milk has its own peculiar enzymes, or ferments, which are supposed to act by supplementing the work of the undeveloped digestive tract of the young mammal, and thereby strengthening its digestion. These ferments are believed to have their origin in the maternal blood stream, and there is known to be a whole series of these ferments in human milk that do not exist in cow's milk.

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* Read before the Philadelphia County Medical Society, December 10, 1913, part of the program on "The Preservation of the Normal Child."

† Rose. Deut. Monatschr. f. Zahnheilig, 1905, Vol. XXIII., p. 13, quoted by Griffith; Section of Diseases of Children, American Medical Association, 1912. Rose studied 164,000 persons with relation to the later influence of the diet which had been given in the first year of life, and found that even in men capable of military service, the disadvantages resulting from bottle-feeding during their first year of life were easily diagnosed.

‡ Boeckl, the former Director of the Berlin Statistical Department, says the mortality of bottle-babies is twenty times that of breast-fed babies. Holt says four-fifths of the deaths under one year are in infants who are artificially fed.

Moro* has also shown that there is an increased immunity obtained through breast milk. That is, that there is a higher bactericidal power in the blood stream of mother-fed babies, which is supposed to be due to these ferments. He showed that the bactericidal power of the infant's blood at birth corresponds very closely with the placental blood, and following a breast feeding there is an increase in bactericidal power, but following an artificial feeding the bactericidal power rapidly diminishes. That this bactericidal power is not due to the improved nutrition of the infant by the use of breast milk was still further proved by Moro, for he found that even in weak and delicate breast-fed babies the bactericidal powers were greater than in healthy bottle-fed babies, and as a result of this condition nursing infants are, as is well known, practically immune to the various infectious diseases.

Holt, in his last edition, 1911, "Diseases of Children," says: "In spite of all efforts to the contrary, it is nevertheless a fact that the capacity for maternal nursing is steadily diminishing in this country, chiefly in the cities, but to a considerable degree in the rural districts as well." He finds that less than 25 per cent. of women are able to continue nursing for as long as six months. This opinion is also voiced by many other prominent authorities. Now, the question is, whether this deplorable condition is one that can be overcome, or is it one that is inevitable? I submit the following data to prove that the condition is not an inevitable one. Some of the German lying-in hospitals record as their recent experience that all mothers can nurse their babies, but that many do not do so is because the mother has to go out to work, or for some other economic or social reason, some of them very trivial.

In the midwifery school of Stuttgart in 1882, only 23 per cent. of the mothers were able to nurse their babies, but in 1904, nearly 100 per cent. of the mothers, as a direct result of proper feeding and moral suasion, were able to nurse their babies. (Pfaundler and Schlossmann, Vol. I., p. 381.)

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* Wien. Klin. Woch., Vol. XIV., 1901, p. 1,073.

A similar experience is cited by Jaschke (*Med. Klin.*, 1908, Vol. IV., p. 257). In Heidelberg, in 1904, only 64.01 per cent. of the babies were breast-fed, while in 1907, 86.14 per cent. to 97.22 per cent. were breast-fed. In this country, the following reports are also of great interest; Dr. Herman Schwartz reported to the American Association for the Study and Prevention of Infant Mortality, Baltimore, 1910, that in 1,500 women studied, 96 per cent. were able to nurse their babies one month or less; that 88 per cent. nursed them for three months, and 77 per cent. for six months. Six women could not nurse at all on account of inverted nipples, and four women seemed to have no milk at all. This report is most conclusive in showing that nearly all women can nurse their babies at least for a time. Again, Dr. J. P. Sedgwick, of Minneapolis, reported to the same Association in 1912 the results of a questionnaire sent to some of the married physicians in the United States. From the answers received, he drew the conclusion that 80 per cent. of the wives of American physicians succeed in nursing one or more children three months or longer. The above reports lend encouragement to the view that the period of lactation can be extended, when its importance is fully appreciated, and proper measures instituted. And, finally, we have the authority of the Nestor of American medicine, Abraham Jacobi, who says in his presidential address to the American Medical Association, 1912: "But, after all, truth will crop out. There is rarely a woman who cannot nurse her infant." All this testimony is just what we might expect, for it is unthinkable that a function which has been developing through countless eons of time, from the Marsupial age up to the human species, could be abrogated into disuse almost in the lifetime of the present generation.

From this scientific study it seems evident that breast milk is the only milk that promises any certainty of promoting the proper physiological development of infants.

Therefore, the next point for consideration is, How can we increase the supply of breast milk? The answer to this is that the prospective mother must receive such careful hygienic care all through her pregnancy as will fit her physically and mentally for nursing.* Especially during the latter months of pregnancy her nipples should receive daily attention, and she should be urged to drink daily at least two quarts of water. This careful care must continue after delivery. It is very important for the establishment of lactation that the breasts fill up on the usual third day, and to accomplish this there is no stimulus comparable to the sucking of a hungry infant. The baby should be put to the breast as soon after the mother is rested after delivery as possible, and then every four to six hours until the lacteal function is established, and then every two hours. I think it is a mistake to wash a baby's mouth, for there is danger of producing abrasions of the tender mucous membrane; it is much safer to wash the mother's nipples with boric acid solution before and after nursing. The practice of feeding a baby warm water or tea as a routine measure is also, in my opinion, to be condemned. If the baby's urine is scanty, and it shows signs of hunger because there is no lacteal secretion, it may be fed artificially, otherwise it is better to let the baby work for its dinner, and by vigorous nursing help establish the maternal secretion. The nursing mother should be allowed a liberal diet, with plenty of milk, at least one quart daily, and also thin cornmeal gruel, as recommended by Dr. Southworth, who advises one to two tablespoonfuls of yellow cornmeal boiled in one quart of water, in a double boiler, for five hours and drunk at intervals during the day. Yellow cornmeal mush with milk, or the old-fashioned pap made with cornstarch, is also excellent, or if milk is objectionable cocoa made with milk may be tried. I have adopted the method first proposed by Dr. Buckley, who advises that milk be given one hour before meals, diluted with one-third boiling water, his belief being that the milk thus administered does not go through the stomach in the usual way, but it is absorbed directly into the lacteal duct from the stomach. My experience is that milk so administered is very easily digested.

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* I am not considering the cases where nursing is contraindicated because of disease.

For the child to secure the full benefit of the breast milk certain conditions must be observed: The baby should not be fed too frequently. A colicky baby is generally one that gets too much milk, so the length of the nursing should be diminished; sometimes even five minutes is sufficient, and the intervals between nursings should be increased. An excellent method of accurately determining the amount of nourishment the baby is receiving is to weigh it for a few times, just before and after each feeding. Often the stools are green and loose when the baby is insufficiently fed, or it has colic and curds in the stools because it is over-fed, and the careful weighing will assist in diagnosing either of these conditions. When the baby does not gain in weight it is rarely because the mother's milk is bad, but it is generally because there is not sufficient milk. The only way to stimulate the mammary gland to secrete more milk is to thoroughly and regularly empty it. The child should be put to the breast regularly at three-hour intervals, for there is no stimulus to the mammary gland like the sucking of a baby. A mother often drops a breast feeding with the mistaken idea that she has not enough for every feeding, and so will save it for the night. Such a practice is fatal to successful nursing. The only stimulus to which the gland reacts is the regular application of the hungry lips of the infant. This cannot be said too often or in too many ways. If after persistent, careful care the breast milk still remains insufficient, it should not be rejected, but supplemental modified milk feedings introduced; for example, if by careful weighing before and after feeding you find the baby of, say, three months is only getting 1 ounce, the necessary 3½ to 4 ounces may be administered by the bottle following the breast-milk feeding. This is a method often employed, and testimony of its value is frequently advanced. In cases of feeble, atrophic, bottle-fed infants, the great value of small quantities of breast milk daily is also a common experience. It is probable that the benefit of feeding breast milk in small quantities lies in its ferments, which seem to supply what is needed in the starving organism.

The growing faith that breast milk is the only proper feeding for infants is finding social expression in the "Consultations de Nourissons," founded in Paris by Budin, which by proper instruction in nursing has increased the number of cases of maternal nursing among the poor by 20 to 30 per cent. The consultations conducted in the milk stations in our American cities are along the same lines. And, finally, our baby shows are doing magnificent work in urging by placards, pictures and counsels the value of breast milk. The following from one of the placards displayed at one of the Philadelphia baby shows is a fine summary of the reasons for all this activity in endeavoring to rescue this age-old function from disuse: "You cannot raise a race of sturdy men and women on the bottle. If a nation is to possess vigor, it must provide mothers in fact as well as in name—mothers who nourish their offspring at their breasts."

INVESTIGATIONS IN VULVOVAGINITIS BY MEANS OF THE FEMALE URETHROSCOPE.*

BY JOHN F. SINCLAIR, M.D.,
Philadelphia, Pa.

The many conflicting opinions and theories that have held sway concerning the etiology of vulvovaginitis have been recorded historically by Epstein,[1] Alice Hamilton,[2] and more recently by Edith Rogers Spaulding,[3] with such clearness that I will not attempt a repetition of that which is well known to us all. Suffice it to say that since the discovery of the gonococcus by Neisser, in 1879, the great majority of medical men have slowly but surely come to regard vulvovaginitis as a serious infectious disease not usually venereal in origin, but in the vast majority of instances due to the Neisserian organism.

The consensus of opinion at the present time seems to group vaginal discharges under two heads, *i.e.*, simple vaginal catarrh and specific vaginitis due to the gonococcus.

Its widespread prevalence and its terrible infectivity are perhaps less clearly appreciated.

It was primarily with a view of improving our methods of prophylaxis that the present study was undertaken. The unreliability of the bacteriological examination of smears is well known, and the characteristic tendency of the disease toward periods of latency is so misleading that new and improved methods of vaginal examination were eagerly sought.

In January last, Leopold and Rubin[4] reported their experiences with the electric-lighted female urethroscope in searching for evidences of vaginitis in children. This appeared to be an improvement upon the use by Koplik,[5] in 1893, of Skene's urethral speculum for this purpose and we determined to test its efficiency as a diagnostic aid.

Eighty-three infants, admitted to the Babies' Hospital of Philadelphia during the current year, have been examined with the female urethroscope. All were under three years of age. Upon arrival at the hospital a vulvar smear was made in every case, and the bacteriological findings noted. Only the negative cases were admitted to the general wards. All positive and suspicious cases were sent to isolation wards for further study. The examination with the electric-lighted female urethroscope was made as far as possible within twenty-four hours and a

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* Read at the Joint Meeting of the Philadelphia, New England, and New Jersey Pediatric Societies, and the Pediatric Section of the New York Academy of Medicine, at Boston, November 8, 1913.

Group I. Positive.

Vulvar Smear		Clinical Condition	Vaginal Smear		Clinical Condition	Bichloride Smear		Complement Fixation Test		Date of Onset	Treatment	Complications and Sequelae	REMARKS
Date	Report		Date	Report		Date	Report	Date					
6-13 7-21 7-22	—Case No. 4 Negative Negative Positive	—L. H.— Normal Normal Discharge	7-22	Positive	Much free pus about cervix	7-22	Pus no organisms	8-22	Neg.	7-22	Routine		6-13 *Some extracellular diplococci* Discharge varied from profuse to slight from 7-22 to 8-8. Was slight to 8-26 varied from slight to ab. 8-26 to 8-10. No discharge for 19 days before leaving hospital.
7-21 7-26	—Case No. 5 Negative	—M. G.— Scanty discharge	7-22 7-28 8-2	Negative	(1) Bright red hemorrhagic spots on cervix (2) Redness of cervix (3) Hyperemia about cervix	7-22 7-28	Negative	8-22			Routine		Slight discharge—13 days. No discharge—15 days. Slight discharge—1 day. No discharge—14 days.
5-25 7-21	—Case No. 6 Negative Positive	—A. Z.— Normal Vaginitis	5-25 7-26	Negative Positive	Normal Free pus about cervix	7-26	Much pus No organisms	8-22		7-21	Routine		Vaginal discharge was slight from 7-21 to 9-16. There was no discharge for the last 14 days the baby was in the hospital.
8-11 8-13	—Case No. 9 Negative Positive Many pus cells and gonococci	—F. C.— Normal Vaginal discharge	8-11 8-14	Negative Positive	Normal Free pus about cervix					8-13	Routine		Slight discharge on 8-13, but no discharge after that date although baby remained in hospital for 20 days.
7-30 8-13	—Case No. 14 Negative Positive	—A. B.— Normal Profuse discharge	8-13	Positive	Free pus about cervix						Routine		Profuse purulent discharge for 7 days. Then slight for 7 days. Child removed under protest at that time.
6-5	—Case No. 15 Positive	—G. S.— Vaginitis discharge	6-5	Positive	Hemorrhagic areas on cervix denuded of mucous membrane. No pus								Died on third day in the hospital of pneumonia.
7-16	—Case No. 26 Many pus cells with intracellular diplococci	—I. B.— Vaginitis discharge	7-17 7-23 8-2	Pus cells with intracellular diplococci also r.b.c. and epith. cells. No typical gonococci found in vaginal smear Pus cells	Pus and blood about cervix Hyperemia						Routine	Eczematous condition about vulva, buttocks, and thighs	Vaginal discharge for 18 days. No vaginal discharge for 30 days prior to leaving the hospital.
5-25 7-21	—Case No. 33 Negative Positive	—H. B.— Normal Vaginitis	5-25 7-22	Negative Positive	Normal Free pus about cervix			9-2		7-20	Routine	Gonorrheal ophthalmia of left eye which commenced 7-20. Smear positive for gonococci	The vaginal discharge was slight except on one occasion, but persisted from 7-20 to 9-1:—disappeared for 6 days, to return as slight on 2 days, and then again disappeared and was absent during the remaining 19 days the baby was in the hospital.

	—Case No. 34	—M. K.—											
5-25 7-21	Negative Positive	Normal Vaginitis	5-25 7-24	Negative Negative	Normal Normal	7-24	Negative	9-2		7-28	Routine		Discharge was "slight" to "profuse" 7-23 to 8-17; "slight" only to 9-6. "No discharge" to 9-9. "Slight" to 9-13. No discharge for 16 days prior to leaving hospital.
	—Case No. 36	—R. W.—											
6-26	Pus cells and extra cellular diplococci	No discharge	6-29	A few r.b.c. some pus and lymph cells. No organisms	Hemorrhagic areas on cervix. No free pus	6-29	No gram negative cocci Some gram positive organisms	9-2	Neg.		Routine		A slight vaginal discharge appeared on 8-4, was profuse on the 4 following days. Was slight for 11 days. No discharge for 3 days. Slight discharge for 3 days. No discharge for 20 days. Slight discharge for 5 days. No discharge for one day. Slight discharge one day. No discharge for 2 days. Slight discharge one day. No discharge one day. Slight discharge 2 days. No discharge on day baby was taken home.
			8-4	Positive	Free pus about cervix								
	—Case No. 37	—B. L.—											
7-21	Negative	Normal	7-24	A few pus cells, many micro-organisms	One hemorrhagic spot								Slight discharge for 18 days. No discharge for 37 days. Slight discharge one day. No discharge for the last 4 days she was in the hospital.
7-28	Positive	Discharge	7-29	Positive	Free pus about cervix	7-24	A few pus cells	9-2		7-28	Routine		
	—Case No. 39	—M. F.—											
5-24	Negative	Normal	5-28	Positive	Free pus about cervix. Removal of endoscope brought with it a small amount of thick yellow pus								There were at no time visible signs of a vaginal discharge. Referred to the Philadelphia Hospital.
	—Case No. 61	—A.McC.—											
5-9 7-21 7-30 8-2	Negative Negative Negative Negative	Slight dis. Normal Normal Normal	5-13 7-24 7-27 8-2	Negative Negative Negative Positive	Slight reddening of cervix No pus or hem. spots One hem. spot on cervix Pus about cervix slight hem.	7-24 7-27 7-28	Pus cells No organisms Salt solution smear negative Pus and lymph cells No organisms			7-29	Routine		7-31 Profuse discharge lasting 3 days. Slight discharge for 12 days. No discharge for four days.
	—Case No. 75	—H. S.—											
10-18	Positive	Normal	10-18	Positive	Cervix reddened. Os contains plug of mucus. Pus in the vaginal vault. One hem area on cervix. Some flecks of pus on cervix							Proctitis	Referred to the Philadelphia Hospital.
	—Case No. 83	—V. R.—											
10-17	Positive	Normal	10-18	Positive	Vaginal walls and cervix are apparently normal except for a few flecks of pus								Referred to the Philadelphia Hospital.

GROUP II. HIGHLY SUSPICIOUS.

VULVAR SMEAR		CLINICAL CONDITION	VAGINAL SMEAR		CLINICAL CONDITION	BICHLORIDE SMEAR				Complement Fixation Test	REMARKS
Date	Report		Date	Report		Date	Report	Date	Report	Treatment	
7-25	—Case No. 7 Negative	—M. L.— Normal	7-28	Many pus cells and micro-organisms. No typical gonococci	Free pus about cervix	7-28	Much pus and micro-organisms No typical gonococci	8-22	Negative	Routine	Slight discharge 7-28 to 8-6. No discharge during the remaining 33 days in the hospital
8-10	—Case No. 8 Negative	—M. B.— Normal	8-11	Pus cells but no diplococci	Free pus on cervix			8-22	Negative	Routine	Slight discharge 3 days; remained in hospital for 47 days without any return of discharge
8-7	—Case No. 19 Negative	—R. S.— Normal	8-11	Pus cells, no diplococci	Free pus on cervix					Routine	Slight discharge for 7 days. No discharge for 4 days before death from gastroenteritis
8-25	—Case No. 29	—L. W.—	8-26	No gonococci	Pus and hemorrhagic areas about cervix						Remained in hospital only 6 days
7-30	—Case No. 35 No pus cells, Diplococci present	—A. S.— Vaginal discharge	8-2	Very few pus cells	Hyperaemia			9-2	Negative	Routine	Discharge for 5 days, then no discharge for 15 days. Discharge for 1 day. No discharge for the remaining 25 days prior to leaving hospital
7-18	—Case No. 41 Many bacteria No typical diplococci	—M. M.— Purulent vulval discharge	7-18	Negative	Normal	7-18	A few epithelial cells. No organisms				Died of gastroenteritis within 24 hours after admission
8-25	—Case No. 44 Negative	—K. I.— Normal	8-26	Many epithelial cells, some pus cells, many bacteria. No diplococci	Pus and hemorrhagic areas about cervix						No discharge from 8-28 to death on 8-31 from enteritis
7-28	—Case No. 66 Much pus, many micro-organisms. No typical gonococci. Intracellular diplococci smaller than gonococci	—I. L.— Discharge present	7-28	Pus cells	Free pus about cervix					Routine	Discharge for 7 days. No discharge the last 34 days in the hospital

GROUP III.

CASE No.	INITIALS	COMPLEMENT FIXATION TEST	REMARKS
Case No. 4	L. H.	8–22 —	Smear positive for gonococci on 7–22 much free pus about cervix.
Case No. 5	M. G.	8–22	Smear negative for gonococci 7–21 and 7–22. Scanty discharge from vulva on admission. Endoscopic examination shows bright red hemorrhagic spots on cervix. General hyperemia of cervix.
Case No. 6	A. Z.	8–22	Smear positive for gonococci on 7–21 and 7–26. Vaginal discharge from 7–21 to 9–16. Free pus about cervix on 7–26.
Case No. 7	M. L.	8–22 —	Smear showed many pus cells and micro-organisms. No typical gonococci. Free pus about cervix.
Case No. 8	M. B.	8–22 —	Smear showed pus cells but no diplococci. Free pus about cervix.
Case No. 33	H. B.	9–2	Smear positive for gonococci on 7–21 and 7–22. Vaginal discharge 7–20 to 9–1. Free pus about cervix. Gonorrheal ophthalmia of left eye 7–20. Smear from eye positive for gonococci.
Case No. 34	M. K.	9–2	Smear positive for gonococci 7–28.
Case No. 35	A. S.	9–2 —	Vaginal discharge on admission 7–30. Smear showed no pus cells—and diplococci present on 7–30. Smears show a few pus cells on 8–2. Cervix appears hyperemic.
Case No. 36	R. W.	9–2 —	Smears show pus cells and extra-cellular diplococci 6–26. No discharge. Smear from vaginal vault positive for gonococci on 8–4. Free pus about cervix.
Case No. 37	B. L.	9–2	Smear positive for gonococci 7–28 and 7–29. Discharge from vulva. Free pus about cervix.

vaginal smear was taken and sent to the laboratory for bacteriological diagnosis.

In taking these smears we have used dry swabs, moist swabs and the platinum loop. The last (the platinum loop) has given the best results, the moist swabs being somewhat less satisfactory, while the dry swabs have proved to be much inferior.

We have also used a 1-5,000 solution of bichlorid of mercury, injecting it deep into the vaginal vault with a pipette provided with a small rubber bulb and then recovering the solution, centrifugating it, and subjecting the sediment to careful bacteriological examination.

This method has not proved as serviceable in our hands as we had expected, nor have we been able to get the good results with it which were reported by Van Giesson.[6] However, this was probably due to our technique, as Hamill and Kolmer speak highly of the method as employed by Howland at Johns Hopkins.

The complement fixation test was employed in 10 cases, and the results are detailed herewith as shown in the chart, *i.e.,* Group III.

We are indebted to Dr. John A. Kolmer[7] for his kindness and courtesy in conducting the laboratory work incident to making the complement fixation tests. They are, we believe, the first series of complement fixation tests made on infants which are accompanied by notes of endoscopic examinations of the cervix and vaginal mucosa. That 50 per cent. showed a positive reaction to the test is also of interest, as former investigators, notably Schwartz and McNeill,[8] in their series, were unable to report any positive reactions. More recently McNeill[9] has reported a series of 8 cases, all positive to the complement fixation test.

It will be noted that Cases Nos. 7, 8 and 35, in Group III., were clinically "suspicious" and are to be found in Group II., while Cases Nos. 5, 6, 33, 34 and 37 were clinically positive and belong to Group I. Case No. 4 furnished positive smears on 7/22 and much free pus was found about the cervix on endoscopic examination. But at the time the blood was taken on 8/22 for the complement fixation test, the patient was clearing up, the discharge being noted as slight.

Case No. 36 was a very suspicious one on the day of admission to the hospital, and finally on 8/4 a smear from the vaginal vault was positive for gonococci and free pus was noted about the cervix. Yet at the time the complement fixation test was made she had had no discharge for seven days and was clinically much improved.

The source of infection was sought for, and an effort was made to fix upon the date of onset, when this was possible. Complications and sequelæ were noted when present. It is to be regretted that it was found impossible to have cultural tests made.

Of the 83 cases examined, 16, or 19 per cent. (Nos. 5, 15, 26, 36, 39, 61, 75, and 83, as shown in Chart No. I., and Nos. 7, 8, 19, 29, 35, 41, 44 and 66, as shown in Chart No. II.), were found to be infected with the gonococcus at the time of admission to the hospital or to present highly suspicious evidences of such infection. Seven cases (Nos. 4, 6, 9, 14, 33, 34 and 37), which were negative upon admission, subsequently developed vaginitis of specific origin. Five of these (Nos. 4, 6, 33, 34 and 37) had been in the hospital from five weeks to thirteen months, and had shown no evidences of vulvovaginitis on repeated examinations. They were sent to a convalescent home in the country between June 3d and June 26th, and no vaginal discharge was noted among the infants until July 20th, when one of the babies was reported to have gonorrheal ophthalmia, and examination disclosed also a specific vulvovaginitis. From this time to July 29th 4 additional cases of Neisserian infection were discovered.

Of the remaining 2 cases (Nos. 9 and 14) one was reported as negative bacteriologically and clinically on August 11th, but positive two days later. The other baby was negative when admitted in July 30th, and did not present positive evidences of vulvovaginitis until August 13th.

Nine cases (Nos. 4, 6, 9, 14, 33, 34, 36, 37 and 61) admirably illustrate the well-recognized tendency to latency in this disease and suggest the thought that one of the great questions in regard to proper prophylaxis has to do with the early recognition of the infectious agent in these latent cases.

Upon the day of admission, 5 cases (Nos. 7, 8, 19, 39 and 44) out of the series of 23 were negative according to the report of the vulvar smear, but proved to be positive or highly suspicious upon subsequent endoscopic examination and study of the vaginal smear.

In other words 21.74 per cent. of the total number of cases to be found in Groups I. and II., would have escaped detection without the use of the electric-lighted female urethroscope.

Only 7 babies (Nos. 5, 15, 26, 35, 41, 61 and 66), or 30 per cent. of the cases in Groups I. and II., showed any visible signs of a discharge upon admission.

The source of infection was a most difficult question to determine and in none of our cases could it be definitely settled. The date of onset could only be accurately recorded in those cases beginning *de novo* in the convalescent home or in the hospital.

The following complications were noted, each condition occurring but once: Ophthalmia, and eczematous condition about the vulva, buttocks and thighs, and proctitis.

The treatment consisted of irrigations of potassium, permanganate 1-8,000 and local applications of argyrol in 20 per cent. solution. When the discharge became scanty a solution of hydrochloric acid, 1-10,000, was substituted for the solution of potassium permanganate.

Irrigations with both of the above solutions were discontinued with the disappearance of the discharge and were thereafter only employed on days when a discharge was again present.

To be effective prophylaxis must begin with a campaign of education in the homes where infants are born and raised, as well as in all manner of institutions which have to do with the various phases of child welfare. Day nurseries, infant and orphan asylums, hospitals, shelters, public bath houses, recreation centers and even our schoolhouses are prolific sources of infection, and will continue to be, until adequate medical supervision is exercised and individual cases are isolated until free from the specific organism.

In day nurseries, shelters, foster homes of every description, and in hospitals, every child should be carefully examined upon admission for clinical and bacteriological evidences of gonococcal infection and promptly removed or isolated if the findings are positive. Proper isolation in institutions demands employment of special nurses, who shall have no other duties, or in any way come in contact with babies or children in other departments of the institution. The lay helpers should be free from gonorrheal infection and this should be determined by bacteriological examinations and by the complement fixation test. Systematic examinations of all inmates of such institutions should also be made with thoroughness at convenient intervals, that latent cases may be early detected and isolated before becoming new centers of infection.

In the case of public bath houses, recreation centers and schools, efficient supervision should be exercised by properly qualified trained nurses so that every suspicious case may be promptly excluded and referred to a physician for treatment.

Boards of Health should be empowered by law to make gonorrheal infections reportable and to exercise their authority along lines similar to those which they now employ in dealing with tuberculosis.

Medical attendants, especially gynecologists and genitourinary surgeons, should inform their patients clearly as to the nature of the disease and the danger of communicating it to innocent babes and children, at the same time giving minute instructions how they may safeguard those about them.

Special clinics for the treatment of gonorrheal vulvovaginitis should be established in all the large cities as has already been done in Boston and New York.

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Thymus in Graves' Disease.—Rahel Hirsch (*Deutsch. med. Woch.*, No. 44, 1913). Children bear thyroid preparations much better than adults and rarely acquire Graves' disease. The reason may be that their active thymus is able to neutralize the excessive or morbid activity of the thyroid gland. This observation led the writer to try thymus extract in cases of exophthalmic goiter. She used thymin-poehl in tablets of 0.5 gram each, but doubtless any good thymus preparation would serve as well. A typical case of the disease gained 30 pounds in two months and improved so markedly that a contemplated operation was no longer indicated. A number of patients, in whom an operation had led to no improvement, lost all of their symptoms as a result of the thymus therapy. In view of the harmlessness of the treatment it seems to deserve a trial.—*Interstate Medical Journal.*

THE POSITION OF THE STOMACH IN CHILDREN.*†

BY JAMES WARREN SEVER, M.D.,

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Mr. President and Gentlemen:—

I wish to-night to speak to you in regard to the position of the stomach in children. During the past year or more, by means of the bismuth meal and the X-ray, I have systematically examined a large number of stomachs of children of various ages and physiques, in an effort to determine the average location of the stomach in the erect position of the individual. A criticism which may be made is that these data have been gathered from the so-called hospital class, which is supposed to be represented by individuals rather below par than above it, and also that these children would not have come to the hospital were it not supposed that they had something rather definite the matter with them. This criticism, however, is not well founded, for it can be stated that many of the children examined during this investigation did not represent abnormal or unusual types of the so-called normal child. They proved to be in no way more round-shouldered than the usual school child.

The subject is one which cannot be presented adequately here by mere statistics, so that I shall offer a general statement of the conclusions arrived at through a study of these data.

In a study of the literature of the subject, we find much that will have to be discounted, if not altogether discarded, in the future, as we become more cognizant of the subject, and I believe that so far we have been led to lay undue stress on the condition of so-called visceral ptosis, congenital or other, in children.

Now, what is the normal position of a child's stomach? I cannot find that this question has ever been accurately determined.

Holt states that if the lower border of the stomach comes nearly to the umbilicus the stomach is dilated, and if it is below the umbilicus it is much dilated. Practically all text-books and monographs on the subject speak of the normal position of the stomach as being well above the umbilicus, the lower border being in the region of the second lumbar vertebra.

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* Read before the Joint Meeting of the New England, the Philadelphia, the New Jersey Pediatric Societies, and the Pediatric Section of the New York Academy of Medicine, at Boston, November 8, 1913.

†From the Orthopedic Department of the Children's Hospital, Boston.

Butler found in an examination of 155 children that 40 per cent. had the lower border of the stomach when distended by gas within half an inch of the umbilicus. In several older children, who had bismuth examination of their stomachs, the picture showed the lower border of the organ below the umbilicus, but these cases showed also the typical enteroptotic habit and dislocated kidneys. He believes that displaced stomachs are exceptional in early childhood, that is, up to twelve or fourteen years of age.

Richard R. Smith found by dilating the stomachs of 57 children that the lower pole was well up in the abdomen, and, in fact, he found there was no lowering of the lower border of the stomach which could be called a prolapse. He believes, with Holznecht and Hulst, that the lower border of the stomach should be in the region of the level of the pylorus, that is, about the second lumbar vertebra.

Goldthwait and Brown state that normally the lower border of the stomach is about on a level with the second lumbar vertebra, but that the position of the abdominal viscera may be greatly modified by the posture which may be assumed by the individual.

Chase states that it used to be generally agreed that in the absence of dilation, gastroptosis was present in adults whenever the lower border of the stomach was found at or below the umbilicus. Yet in a study of 39 normal adult males he found in 16 cases the lower border at or below the umbilicus. In 3 it was at the umbilicus, and in 13 was from one-quarter to one and three-fourths inches below. He quotes Hertz and Morton, who found that in seventeen healthy young men in the upright position the greater curvature was invariably below the umbilicus. Groedel, in 36 men and 54 women having no gastric disturbance, found the average distance of the lowest point of the lower border below the umbilicus was one inch for men and two inches for women. He believes that in the treatment of these cases there will be fewer attempts to elevate and support stomachs, since so many formerly considered prolapsed are now known to be within their normal limits.

In addition, certain students of this subject have taken the ground that the body formation or posture is the principal cause of ptosis. Coffey states that medical men take the ground that in most cases visceral ptosis is due to malnutrition, neurologists that it is due to a central nervous condition, orthopedic men that it is due to body malformation, Lane that it is due to the erect position of man, which has caused overstretching of the peritoneal supports of the abdominal organs. Coffey also states that the normal stomach in the erect position comes just below the umbilicus. The pediatrician is as yet unheard.

This sketch of the literature gives you an idea of the diversity of opinions as to the normal location of the stomach and how indefinite this location is. Some say that it is, or should be, at the second lumbar vertebra, others that it should be at the umbilicus, and others that it may be below it. There is apparently no uniformity of opinion in regard to this point.

I am not going to discuss in this paper the already well-known embryological and anatomical theories of the causation of ptosis, but will add that it is a commonly stated fact that about one person in five is born with a congenitally defective support of the colon and stomach, which may obviously lead to a greater or lesser degree of visceral ptosis. I am, however, going to show you that in children at least the position of the stomach is, so far as I have observed, in over 90 cases, a much lower one normally than has heretofore been suspected, and also that we must revise our ideas as to the normal position of the stomach in children, regardless of their posture, which latter condition I believe has been greatly over-estimated as a factor in ptosis in children because of lack of adequate data in regard to the normal position of the child's stomach.

Methods of Examination.—Before going on at once to the study of the X-ray findings in these cases it might be well to state that there were 83 children examined, of whom 60 were girls and 23 were boys. These children varied in age from four to eighteen years, the average age being about ten or eleven. The height was noted and taken in the usual way by means of a vertical rod. The weight, state of nutrition and general body development were also observed, besides the attitude and the size, shape and capacity of the thorax, together with the shape of the costal angle. In every case I tried to palpate the kidneys, but was unable to do so in any case, regardless of the relaxation of the abdominal wall or the degree of ptosis of the stomach. No attempt was made to outline the stomach by palpation or by inflation by gas, for it was felt that this was a rather unsatisfactory and unreliable method.

The position of the stomach was determined as accurately as possible by means of the X-rays in the following manner: The child was given to drink about 2½ to 3 ounces of bismuth subcarbonate, stirred up in a glass of water. Immediately following this he was put in front of the X-ray tube and about eighteen inches away from it, standing in his usual erect attitude, with the back to the tube, which was on a line with the umbilicus so as to prevent, if possible, any distortion. The plate usually pressed lightly against the abdomen. Very short exposures were made. Following this in some cases a picture was made of the child lying on its face with the plate underneath so as to get a picture of the stomach in that position. No attempt was made to put a coin on the umbilicus or to mark it in any way, for it seemed a rather indefinite landmark, and that a more reliable and constant relation could be obtained by using the crests of the ilia for purposes of comparison. On account of the difficulty of getting these children to report again within twenty-four hours no attempt was made to get a record of the colon. Besides showing the position of the stomach in these cases, the height, weight, development and nutrition were also observed, for these points are said to be of importance in connection with ptosis.

A number of the children were frail, with poor musculature, little body fat, and were under size and weight for their age, while others were well above the average. The averages by age, height and weight show children well up to, and in some instances above, Dr. Holt's averages for children of similar ages. They cannot then be called as a class either under-developed or nourished in relation to their ages, so that they must then, so far as these conditions hold, be called average normal children. Of the girls, 47 were well developed and nourished and 13 were poorly developed and nourished. Of the boys, 21 were well developed and nourished, and two were poorly developed and nourished.

This condition of good development and nourishment is of importance in view of the theory that visceral ptosis may be partially due to the lack of proper physical development and a proper and adequate amount of body fat. As far as I was able to observe, general conditions and body weight, with or without much adipose tissue, had very little to do with the position of the stomach. Many children who were very well nourished had quite as much ptosis as others who had no signs of fat about them, and, in fact, there could be no rule established in regard to this point.

The Thorax.—The shape, capacity and development of the thorax are supposed to play an important part in the position of the abdominal organs, and so a special study was made in these cases of the size, shape and capacity of the thorax. Here again children and adults differ markedly. In this series the capacity of the thorax was measured relatively by the chest expansion, which averaged as follows:

For 60 girls, 1.64 inches
" 21 boys, 1.86 "
" 81 cases, 1.70 "

This shows a relatively good average chest capacity. In some of the cases there was noted a long, flat, narrow thorax, but there was quite as apt to be a stomach relatively high in these cases as in others with a normal thorax. A number of these cases with a contracted thorax showed a normal or relatively great chest capacity as compared with those of the normal type, and no relation could be established in regard to the shape or capacity of the thorax with the degree of ptosis present or to be expected. The costal angle in these cases was generally normal or broad, as is, I believe, true of children generally.

In the study of the literature, especially in Smith's article, it was noted that great stress was laid upon the so-called index of Bescher and Lenhoff, the determination of which was supposed to give one an adequate idea as to the relative capacity of the upper abdomen. This index is obtained by dividing the jugulo-pubic distance by the waist measure, taken just around the lower ribs, and multiplying by 100. This gives one a purely relative index, and the higher the index the less is the capacity of the upper abdomen supposed to be. This has been done on nearly every case in this series, and has proved to be rather a failure as a means of estimating the probable position of the stomach.

Indices over 80 are supposed to represent a condition of relative incapacity of the upper abdomen, whereas indices under 80 represent a normal capacity of this area. A study of the indices of this series of cases showed the following facts:—

The average index of 50 girls was 80
“ “ “ “ 23 boys “ 75
“ “ “ “ 73 cases “ 78, or normal

These data show a relatively normal average index for this series. The average and individual indices for the cases showed that very little reliance was to be placed on these data as a guide to the presence or absence of visceral ptosis. Cases often with the highest indices showed no other evidences which would suggest ptosis, and others with low or moderate indices varying from 57 to 80 showed all degrees of ptosis. There could be no definite lines or relations established between the index and the shape, development or capacity of the thorax, or shape of the costal angle.

The Position of the Stomach.—We come now, after having covered the other points in our investigation which seemed essential to the proper estimation of the problem at hand, to the anatomical position of the stomach in these cases.

It was noted in the study of the X-ray plates of these 83 children, taking the crests of the ilia as landmarks, that 25 showed the lower border of the stomach opposite the fourth lumbar vertebra, 9 showed it at the level of the crests, and in 49 the lower border was well below the crests, often in the pelvis, often as much as three or four inches below the level of the crests. These findings are of great significance. To find such a uniformly low position of the stomach in such a large series of cases can mean only one thing, to my mind, namely, that there is where it belongs. Other factors may have some slight influence as to the actual degree of low position, but such a generally low position I believe is normal, and that in the future the second lumbar vertebra will have to be discarded as the normal landmark of the lower border of the stomach.

In the study of the X-ray plates I was much impressed by the size and shape of the stomachs, as well as by their low position. The shape varied considerably, although the most persistent type was that of the sink-drain variety, and while they were generally all large organs, a few were more horizontal and near what is generally considered the normal size.

There were very few stomachs presenting the so-called normal "cow's-horn" shape, and none of these were in the position usually regarded as normal. Many of the stomachs were seen in the middle line, but many were also seen well to the left, apparently resting well within the iliac fossa.

Now what has this investigation shown? Namely, that in these 83 cases of generally average developed children, the average position of the stomach is a much lower one than had been previously suspected, and that to find a stomach at or well below the crests of the ilia is not at all unusual. But one of these children had symptoms referable to its digestive tract, which in that case was due to a dilated colon, a condition causing chronic constipation, and not to a stomach which showed a moderately low position. They were otherwise perfectly well as far as their digestive apparatus was concerned.

We must also change our ideas, I believe, as to the shape and size of the child's stomach. As seen in this series, as I have said before, it was generally large and either horizontal or of the sink-drain type. The ideal so-called "cow's-horn" stomach was rare.

In conclusion, I would state that I believe it has been shown by this study that the child's stomach is lower than we generally supposed, and to find a stomach low in a child does not therefore necessarily mean that there is a pathological ptosis.

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THE CURATIVE ACTION OF LEUKOCYTE EXTRACTS IN INFECTIVE PROCESSES.—Hiss and Dwyer (*Medical Record,* September 13, 1913) base their observations on 148 cases of erysipelas. They believe the injection of leukocyte extract affects the course of the disease profoundly. The general symptoms are ameliorated within a few hours after the injection, the temperature drops by crisis within forty-eight hours, as a rule, and the local manifestations perceptibly improve. The duration of the disease is cut two-thirds. They submit the conclusions of Dr. A. V. Lambert, whose experience with this method of treatment is large: Leukocyte extract will abort infections which are treated with the extract within the first forty-eight hours. It will ameliorate the course of older infections and may abruptly terminate them; the longer the infection has existed the less likely is the latter to take place, but it tends to shorten the course of the disease. The toxic symptoms—delirium, headache, nausea and vomiting—are modified and relieved; local pain is lessened. The rash does not disappear immediately, but is apt to be localized.—*The Universal Medical Record.*

A CASE OF MULTIPLE CONGENITAL MALFORMATION.*

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Congenital malformations of one kind or another are not particularly uncommon, but such a variety-shop of abnormalities as this specimen presents would seem unusual enough to deserve attention.

The baby was born on the out-patient service of the Maternity of the Woman's Medical College of Pennsylvania. It was the eighth child of a healthy-appearing Italian woman, thirty-eight years old, whose other children had all been normal. No history of syphilis could be made out. Her pregnancy had been uneventful, and labor was easy, consuming about seven hours all told. The membranes had ruptured before the arrival of the student on the case, and the amount of fluid was not known.

As soon as the baby was born its more conspicuous deformities were readily made out. First, double hare-lip and cleft palate, and then, more striking because of its infrequent occurrence, a large congenital umbilical hernia. The protruding mass, as can be seen in the accompanying pictures, was roughly spherical and nearly half the size of the child's head. The coils of intestine of which it was made up showed plainly through the transparent sac. Lying to the left of the hernia and attached to the sac at its base was a tongue-like projection, dark red in color, which at first sight suggested spleen or liver tissue. The umbilical cord ran from the placenta to the hernia. It was 25 inches long, and normal in appearance up to a point about 6 inches from the child's body, where it began to grow gradually thinner, until in its last 2 inches it consisted of two vessels, practically without any surrounding Whartonian jelly, which were inserted just between the sac and the mass beside it. Before the cord could be tied these vessels ruptured close to the sac, but as no bleeding followed, no attempt was made to ligate.

A close examination of the child showed, as other malformations, a cleft sternum, easily palpable; a supernumerary digit attached to the left little finger; hypospadias and undescended testicles. Withal, the baby was fairly well nourished, measuring 20 inches in length and weighing 6 pounds.

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* Paper read at Philadelphia Pediatric Society, November 11, 1913. For discussion see p. 64.

The child was transferred to the surgical service of the Hospital of the Woman's Medical College, and was operated on by Dr. H. C. Deaver before it was fifteen hours old. When the sac was incised, numerous adhesions were found between it and the intestines, showing that the hernia was by no means a recent one. The mass of intestines was replaced within the abdominal cavity, and the incision closed in the usual way. The baby recovered from the immediate effects of the operation and anesthetic, but died about thirty hours later. There was evidently no obstruction of the bowel, as three meconium stools were passed; the temperature showed wide variations, from 96.4° to 103.8° F.

An autopsy performed by Dr. Mae Myers revealed the following additional points: The accompanying mass which had protruded beside the hernia was found to be attached to fascia between the transverse colon and the greater curvature and posterior surface of the stomach by adhesions. Sections were cut from this mass, and the microscope showed later that it was neither spleen, liver nor Meckel's diverticulum (all three suggestions had been made by those who had seen the case), but a vascular tuft, composed almost entirely of convoluted blood vessels.

The great omentum was absent. The lesser omentum and mesentery were foreshortened, pulling the stomach up and allowing the formation of dense adhesions between it and the retroperitoneum.

The left adrenal was four times the normal size; the right was small and fragmentary. The right kidney was smaller and much higher than the left.

The aorta bifurcated high, and the right common iliac artery was very small, while the right hypogastric artery was absent.

The most curious condition in the specimen was the difference in development of the two sides of the body; the most important from the clinical standpoint was, of course, the hernia. According to Ballantyne such hernias may be met with about once in 5,000 cases; he saw 4 among 331 cases of antenatal disease and deformity. The condition of hernia into the cord is normal enough in early intrauterine life, and to use the words of Webster, the intestines still bulge into the umbilical cord in the second month. The umbilical ring is contracting by this time, however, and it is only if there is arrested development of the abdominal wall at this time that a permanent hernia remains. The malformation may vary within wide limits, from a marked defect in the wall down to merely a patent ring; the hernial sac may contain organs other than the intestines—liver, stomach, spleen, pancreas, kidney and even the heart having been noted; the protruding viscera may or may not be covered with a sac. An article by Fried, published in 1760, describes a case in which the entire intestine, from duodenum to rectum, protruded uncovered through a gap in the wall.

Through the courtesy of Dr. Ella B. Everitt I am able to quote an unpublished case of hers, in which the sac held stomach, liver and small intestines, and an actual defect existed in the abdominal wall above the umbilical ring. The baby was operated on in the second day of its life, and on account of this defect in the wall a considerable portion of the opening could be closed in only with a covering of peritoneum and skin. There was primary union, but added support was given by a binder and hard rubber plate. For a few weeks nutrition and metabolism seemed to be normal, but gradually signs of lack of nutrition developed, and in spite of special care and feeding under the direction of a pediatrist, the child died of malnutrition after about a year.

The etiology of these cases of congenital hernia is unsatisfactorily explained. In this case mechanical factors such as short cord or flexion of the spine must be ruled out, and syphilis in the parents seems unlikely on account of the previous healthy children. That there was arrested development is clear enough, but what was the cause we do not know. It is common, though by no means the rule, to find other deformities associated with the hernia, but such a collection as I have enumerated must be comparatively rare.

The fate of these children is not hard to prophesy. Except when the hernia is small, the outcome of an operation is likely to be unsatisfactory, while without operation the child usually dies of rupture of the sac, strangulation of the hernia or peritonitis.

In conclusion my thanks are due to those of my colleagues of the Woman's Medical College whose names have been mentioned, and also to Dr. Adaline M. Francis, who delivered the case and whose careful notes have added greatly to the accuracy of my paper.

MISCELLANEOUS

THE TONSIL—A VESTIGIAL RESPIRATORY ORGAN.*

The tonsils are probably vestigial organs of respiration, a modified form of gills or branchiæ, surviving from the piscine and amphibious periods of man's descent; yet not deciduous, as were the gills of most amphibians that permanently abandoned aquatic habitats.

Darwin states that: "Still earlier the progenitors of man must have been aquatic in their habits; for morphology plainly tells us that our lungs consist of a modified swim-bladder, which once served as a float. The clefts on the neck in the embryo of man show where the branchiæ once existed."

Haeckel, in his "Evolution of Man," says: "The most important process we meet with in the further ontogenetic development of the intestinal canal in the human embryo is the origin of the gill openings. At the head of the human embryo, the wall of the throat very early unites with the outer wall of the body, and four openings then form on the right and left sides of the neck, behind the mouth, and these lead directly from without into the throat-cavity. These openings are the gill openings, and the partitions separating them are the gill-arches. These embryonic formations are very interesting; for they show that all the higher vertebrates, when in a very young state, reproduce in accordance with the fundamental principle of Biogeny the same process which was originally of the greatest importance to the development of the whole vertebrate tribe. This process was the differentiation of the intestinal canal into two sections: an interior, respiratory part, the gill-intestine, which serves only for breathing, and a posterior, digestive part, the stomach-intestine, which serves only for digestion. . . . Afterward, however, the gill-intestine, which is a memorial of the fish-ancestors, as such, is entirely lost. The parts that remain take a wholly different form; but notwithstanding that the anterior section of our intestinal canal thus surrenders entirely its original form of gill-intestine, it yet retains its physiological function as a respiratory intestine."

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* J. A. Hagemann, M.D., in Medical Record.

Hackel also says in "The Wonders of Life": "In the lower aquatic vertebrates (acrania, cyclostoma, and fishes) the gills are the sole organs of breathing; in the higher animals, that live in the air, they fall into disuse, and their place is taken by the lungs. Nevertheless, heredity is so tenacious that we find from three to five pairs of rudimentary gill-clefts in the embryo right up to man, though they have long ceased to have any function. This is one of the most interesting of the palingenetic facts that prove the descent of the amniotes (including man) from the fishes."

When man's progenitors periodically forsook the waters, the organs we now know as lungs gradually developed from the swim-bladder and, *pari passu,* the gills, not being required during protracted periods, would cease to functionate and would become noticeably atrophied. Yet we can conceive that in consequence of subsequent inundations, or to escape attack by terrestrial pursuers, countless successive generations of these amphibious creatures would intermittently be compelled to resume aquatic habits temporarily, thereby again requiring the functions of the gills as oxygen transmitters. It is reasonable to suppose that unnumbered repetitions of this experience, extending over countless æons, would eventually develop a faculty of regenerating gills, and adjusting their forms and functions to the respective prevailing conditions, eventually resulting in the form of an irregular ovoid body set between a pair of practically parallel muscles, the palatoglossus and palatopharyngeus, known to us with their coverings as the anterior and posterior pillars of the pharynx. These muscles, in man, are supplied by branches from the facial nerve, whose function is largely motor. Contraction and relaxation of these muscles, in the amphibious stage, would result in alternate compression and release of the tonsil, with consequent pumping in and out of the circumfluent water. Examination of the tonsil in its present rudimentary form, particularly as seen in children, reveals a smaller or larger body, dotted with mouths of crypts whose cavities are lined with epithelium. Surely it is not a wild flight of fancy to imagine that the object of this arrangement was to present a greater surface to the water which swirled through the throat, thereby giving additional opportunity to absorb the necessary oxygen. In man, the tonsillar bodies are supplied by branches from the trigeminus and glossopharyngeus nerves, both of which may be traced to the lateral columns of the medulla into the region of the reputed respiratory center, which also might imply a former respiratory function.

When the tonsils have been incompletely removed in very young children there is a marked tendency to regeneration, reminding one of the salamander, who regenerates a leg or an eye so long as there is a fragment of the original left from which the new growth may spring. While the cases are not parallel, both indicate a tendency to restore an organ which may again be necessary to sustain life in the face of hazardous exposures which innumerable progenitors had survived. Only such salamanders remained alive to propagate their species as were able to regenerate a leg or an eye; those unable to do so soon perished and left no descendants. Only those progenitors of man who retained rudimentary gills could continue their existence when a tidal wave washed them off some rocky shore back into their ancestral watery home. Those whose lungs had already become their sole oxygen supplying organs were incontinently drowned. In this manner, when the world was younger, and the waters periodically overflowed the land, a natural selection took place; those individuals who could successfully bring their rudimentary gills into action surviving their more unfortunate brethren. Through incomprehensible periods of time and incalculable repetitions of such experiences an innate faculty of regenerating an "under water" breathing organ was developed which rudimentarily still persists in man, although he has long since become solely a lung-breathing animal by reason of the great changes in the topography of the earth's surface.

This seems to offer a reasonable explanation of the phenomenon frequently seen when an imperfectly removed tonsil shows a tendency to regenerate rapidly. Nature appears to rush to the rescue from force of habit. Only possessors of tonsils survived; and so long was this a law of experience that nature has not yet unlearned the lesson.

THE TYRANNY OF MEDIOCRITY.*

There are certain elements in the practice of medicine which not only pave the way for mediocrity, but actually tend to foster this quality of mind and action. An art whose boundaries are ill-defined and whose foundations are none too secure cannot expect of its votaries a constant search for truth and a spirit which forgets self in the enthusiasm of a noble cause. The high standards which are demanded by public opinion, by examining boards, by legal responsibility, and, above all, by the stress of competition, eliminate actual ignorance and incompetence, so that there remain two classes of physicians—those who may be regarded as the leaders, the elect and the expert, and those who belong to the rank and file of ordinary ability.

What are the causes of medical mediocrity? This term is not a derisive one, signifying neither good nor bad, but of middling quality. The large bulk of work in the practice of medicine requires no extraordinary degree of mental ability or technical skill. The ease with which expert assistance can be obtained, the professional codes which require, and the public opinion which demands, the calling of consultants, frequently relieve the city physician of that burden of responsibility which, more than anything else, can develop the best that is in him. It is remarkable with what complacency the patient's friends, particularly among the poorer classes, submit to the request on the part of the medical attendant that a consultant be called. This is particularly noticeable in tenement-house and lodge practice. The physician, confronted with a difficulty which he has neither the time nor the inclination to solve, takes refuge in the consultation. This by no means always solves the diagnostic problem; in fact, it sometimes increases the difficulty. The original medical attendant, relying upon the superior wisdom of the consultant, pursues a line of treatment which may be inferior to that which his own mind might have evolved, had he given it a chance. In other words, the ease with which consultations may be had, the responsibility being thereby divided, actually places a premium on mediocrity.

This quality of mind is also fostered by routine. The law of habit is at once a beneficent ruler and an inexorable tyrant. Unconsciously, and by slight degrees, the physician may acquire a short way of doing things, and he may be wont to stick to his old methods, even though he may be shown the new and better way of accomplishing certain results. He will tactfully explain away his mental inertia by saying he is old-fashioned, but this is neither an excuse nor a justification.

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* Editorial, Medical Record, August 30, 1913.

When the medical man has established a lucrative practice, when his reputation has been made, when the demands upon his time are such that he is left little opportunity for study and reflection, then it is that mediocrity attains its widest scope. Under these circumstances the practice of medicine becomes a business. The physician has a ready market for his wares and is under no special incentive to improve their quality. Endowed with a shrewd knowledge of human nature, a discretion whose silence wears the mask of wisdom, a disposition to discover and cater to the whims of his patients, an urbanity and poise that reassure the timid and inspire confidence in the disheartened—all these are qualities that belong more to the art than to the science of medicine. They are almost indispensable to success, but success that is worldly and not eternal. They are the faithful handmaids of mediocrity.

With the tendency of modern medicine to divide into specialties, the practitioner is afforded the opportunity of developing his skill in a particular phase of work. The narrower the field the greater are the exactions. In the surgical specialties the tangible and patent character of the work and of the results cause the elimination of the unfit and the survival of those who are really expert. But the specialist, confining his gaze to the narrow compartment in which he works, is often too apt to become myopic to the broader aspects of disease and to the demands of the patient as a whole. This also opens the door to mediocrity.

Editor of ARCHIVES OF PEDIATRICS:

In answer to Dr. C. K. Johnson's query and observations on the effects of frozen milk: He will find a detailed account of the changes which occur in frozen milk and its effects on the infant in Koplik's *Diseases of Infancy and Childhood,* Third Edition, page 111.

Very truly yours,

January 14, 1914.

HENRY KOPLIK.

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held November 13, 1913.

HENRY DWIGHT CHAPIN, M.D., CHAIRMAN.

ON THE BACTERIOLOGICAL DIAGNOSIS AND TREATMENT OF ALIMENTARY DISEASE IN THE INFANT AND CHILD.

DR. RALPH VINCENT, London, England, in this address, stated that since milk was the natural diet of infancy we were compelled in considering it to appraise the actual nature and extent of the pathological condition found in any given case, to consider the precise circumstances in which the same or allied processes occurred in milk outside the body. It was of importance that one should be able to appreciate the nature of the biochemical processes occurring under normal conditions, for one was scarcely in a position to understand the abnormal unless he was acquainted with the normal processes, while one could only estimate the extent and nature of any disorder by the measure of its departure from the conditions of health. In the following classification Dr. Vincent grouped the organisms according to the conditions determining their growth and their action upon milk:—

(1) Bacteria producing lactic acid, but not producing gas. This group was represented by the streptococcus lacticus and the B. lacticus. The streptococcus lacticus was the typical organism growing in pure milk at 38°C. At a later stage, when the acidity had become too great for the streptococci, the B. lacticus appeared, for this organism was exceptionally tolerant of acids.

(2) Bacteria producing lactic acid, carbon dioxide and alcohol. This group embraced the whole of the colon organisms and included the B. acidi lactici of Hueppe, the bacterium acidi lactici of Esten, the B. lactis aerogenes of Escherich, and the B. colic communis. When pure raw milk was incubated the growth of the organisms belonging to this group was inhibited by the growth of the organism belonging to the first group. When milk was grossly contaminated by colon bacilli these might gain the dominance, and in such a case the curdled milk showed evidence of gas production.

(3) Bacteria growing in pasteurized milk. The B. putrificus and the B. enteritidis sporogenes were examples of this group and their products were of a highly irritant and dangerous character.

(4) Bacteria growing in milk after it had been raised to 100°C., owing to the fact that their spores had not been destroyed. These organisms were found in milk that had been boiled or sterilized and in condensed milk. This group embraced a large number of organisms, the chief representative being the B. subtilis, the B. mesentericus, and the B. mesentericus vulgatus. When they developed in the intestine extremely powerful poisons of an alkaloidal character were created and their absorption produced coma and death. These organisms were quite unable to grow in raw milk, for their growth was entirely prevented by the acid-forming bacteria.

A series of examinations made in order to determine the effect of pasteurization at low temperatures showed that the lactic organisms were not destroyed, as they finally appeared after long incubation in every case. In the majority of cases they were so badly injured that they failed to appear at all in twenty-four hours, while the effect of their being unable to develop was shown by the organisms that did develop. These included the B. megatherium, B. subtilis, B. mesentericus, and B. enteridis sporogenes. The employment of such a low temperature was in reality an endeavor to obtain the impossible, namely, a method of pasteurization that should destroy the pathogenic organisms without destroying the lactic organisms. The grave alteration of the milk was shown in the development of acidity and the time of curdling. Fresh milk curdled at 38°C. within twenty-four hours, generally in eighteen hours, the acidity being 60° or 70°, while in pasteurized milk the average time of curdling was fifty-five hours and the average acidity at the end of twenty-four hours' incubation was 20°, which was the acidity of normal milk at the time of milking. In raw milk the B. enteritidis sporogenes never developed. If a milk were heated at 170°F. it was nearly certain that B. putrificus would appear on incubation, despite the fact that there were numerous other organisms in the milk ready to develop if only the conditions were favorable; if the B. putrificus was capable of developing it would prevent the development of the other organisms. Similarly, if the temperature was too high for the B. putrificus to escape destruction, then the B. enteritidis sporogenes would probably develop and hold back all the other organisms of the subtilis type. In pure milk the streptococcus lacticus was the predominant organism. The purer the milk the freer the growth of this streptococci. At 38°C. it grew characteristically in chains. If the milk was contaminated the growth of the streptococcus was interfered with and colon organisms developed at an early stage, with the result that the curd was pitted and if gas production was excessive the curd might be brought to the surface of the milk. After seventy-two hours various forms of fungi or moulds began to develop, their growth being promoted by a considerable amount of acid. The streptococcus lacticus grew rapidly for twenty-four hours, when the acid produced inhibited its growth. In about forty-eight hours no further development was seen. The development of acidity was due entirely to the action of microörganisms, and consequently the temperature at which the milk was kept and the time of exposure to this temperature were the chief factors determining the rate at which acid was produced. The production of acid did not proceed regularly. During the first four hours the acidity increased 1° above the initial acidity; during the second four hours, 2°; during the third four hours, 4°; during the fourth four hours, 17°; during the fifth four hours, 36°, and during the sixth four hours, 48°. The contents of the small intestine were normally acid, owing to the formation of lactic acid from lactose by lactic acid bacteria. The lactose content of the alimentary canal continually diminished as the food products passed through it, until in the lower part of the colon there was none at all. This explained the difference between the flora of the small and of the large intestine. Were it not for the acid condition putrefactive processes would occur. In the soil the conditions were reversed, for putrefaction was the essential process by means of which dead organic matter was decomposed and rendered available in the vegetable kingdom, so that an acid soil was pathological and lime was used upon it. This statement of the effect of acidity was absolute as regarded the obligate proteolytic organisms, but it was relative as regarded the colon organisms. The colon bacilli could act in an alkaline medium and also in an acid medium, but the acid must be moderate in amount.

With regard to putrefaction, the production of ill-smelling products was an incident of putrefaction. Some organisms gave rise to products of most unpleasant odor; others, notably the bacillus mesentericus vulgatus, grew in profusion without creating any change that could be noted by the senses. Thus one of the dangers of pasteurized milk was that it might be loaded with organisms of this character without there being any obvious change to suggest that the milk was not wholesome.

The studies of intestinal bacteriology were hampered by the words "infective" and "pathogenic." These terms were misleading, as they tended to conceal the nature of the problem with which they were dealing.

For examination of the intestinal dejecta, the Zeiss microscope was the most workmanlike and efficient instrument. The condenser should be the aplanatic of N. A. 1.4, and the chief objective should be the 2 mm. apochromatic of N. A. 1.4. A nose piece should not be employed. The most convenient eyepiece was the compensating ocular No. 6.

The methods used involved in some respects a considerable departure from those generally employed in biological research. In making examinations the plate method was not used. By means of a platinum loop a film was made on a glass slide. This film was dried and fixed over the Bunsen flame, care being taken not to overheat it. The two routine staining methods were the Loeffler's blue and a special method staining which the writer had devised, in which the Gram method was used with Loeffler's blue as a differential stain. The great advantage of this method was that it differentiated all the lactic group from the colon group. The normal dejection contained numerous lactic acid bacilli, some colon bacilli, and possibly a few diplococci. This confinement of the streptococci to the small intestine in normal conditions had been amply demonstrated. Both Kendall and Finkelstein had drawn attention to the great tendency of the lactic bacilli to be found in certain cases in almost pure culture. In other cases masses of diplococci or streptococci were seen and these might be combined with lactic bacilli. In other cases they might not infrequently find a mixed specimen, lactic organisms, colon bacilli, together with the oidium lactis. All of these were acid conditions and quite excluded a colon toxemia. That was a valuable indication giving definite information as to what should be done in the way of treatment and in particular what should not be done. Fresh milk would completely rid the intestine of oidium lactic and similar fungi in about twenty-four hours. A cooked milk containing an excessive amount of sugar favored the devolopment of these organisms.

The colon organisms were facultative, fermentative organisms, but were eminently proteolytic when the conditions permitted this. In the normal condition of the alimentary tract fermentatively the acid content of the small intestine prohibited the proteolytic phase, while diminishing acidity favored the fermentative action in the colon, for they are sensitive to acid and could not act in the fully acid condition characteristic of the active growth of streptococci. Thus the colon organism could deal with the remnants of lactose that might pass the ileum, producing not only lactic acid, but a small amount of gas. According to the observations of the essayist the administration of starch markedly encouraged the growth of the colon organisms.

Some considerable practical experience was necessary to enable the observer readily to pick up the leading indications presented by the specimens, but it would be found that the majority of cases were fairly straightforward, while in others there was some special feature to be taken into consideration, and as these were brought into line they generally proved to be extremely valuable in elucidating the special features of the particular case.

Among the workers at the Infants' Hospital there was no doubt that by the means of the bacteriological examination they had arrived at the means of diagnosis which in respect to accuracy and precision was far superior to any other means at their disposal. Their diagnosis and treatment were fundamentally dependent on the reports from the research laboratory. Dr. Vincent cited cases illustrating this point. Upon the question of the relationship of the proteolytic streptococci to alimentary disease, Dr. Vincent said he had not been able to arrive at any conclusion. In the large series of cases examined he had not been able to attribute any serious conditions to the presence of the proteolytic streptococci. As a rule, the children in whom they were present were suffering from a mild colon toxemia.

His investigations in regard to the biochemical changes occurring in raw milk taught that in all such inquiries the usual periods of bacteriological incubation were too long. They systematically investigated the conditions as found in the milk cultures at 38°C., after four hours' and after eight hours' incubation, only prolonging the investigation when this course seemed to be indicated. By observing the nature of the organisms, the order of their appearance, and their relative dominance, they were able to obtain a real conception of the processes occurring in the alimentary canal. Moreover, as the case proceeded, they were in a position accurately to appraise the changing conditions. Dr. Vincent presented a number of typical reports of cases demonstrating the method by which the diagnosis was made. He stated, however, that in England involvement of the intestinal mucous membrane in diarrheal disease in infants was distinctly rare. This statement was based on the microscopic examination of many thousands of cases. In America it would appear that the mucous membrane was more frequently involved, judging from the clinical reports in regard to the presence of hemorrhage. Cases of acute colitis with free hemorrhage caused by the B. enteritidis sporogenes were not uncommon, but he had never seen this kind of a case in a patient under twelve months of age.

In dealing with an intestinal condition due to a dominance of the acid-forming organism, the first line of treatment was the exclusion of all diet calculated to assist the lactic organisms. Raw milk must be forbidden. Cooked milk with the lactose reduced to a minimum amount was indicated. In such cases a reasonable amount of fat might be given and a considerable amount of protein in the shape of caseinogen. If this were given in the shape of milk the lactose might still be too much and they, therefore, might employ a precipitated casein. In these cases chalk might be useful and opium in minute amounts. So some very old-fashioned remedies were found to have their justification in the bacteriological condition of the intestine. A favorite preliminary treatment was albumin water made with normal saline to which a few teaspoonfuls of diluted meat extract were added, while small doses of brandy were given at intervals. Very gradually a milk diet was introduced. Treatment was constantly checked by examination of the dejections. In this class of cases they had been accustomed to exaggerate the value of purgation; active stopping of the diarrhea was not unsound therapeutics, as it gave rest to the irritated intestine by stopping excessive acid production.

The treatment of the condition arising from dominance of the colon organism depended on the age of the child. In infants under six months, and especially under four months, it was a mistake to undertake too active treatment. It was better to adopt measures favoring the gradual development of the lactic organisms by dietetic management than by the administration of pure cultures. If a case was obstinate and did not respond to raw milk, cultures might be administered.

Cases of acute intestinal toxemia caused by the action of proteolytic organisms, in his experience never occurred unless the infant had been fed on cooked food or there had been in other respects some marked departure from rational diet. The result was nearly always fatal.

In cases of bronchopneumonia, dejections should be systematically examined, and upon the appearance of colon dominance cultures of streptococcus lacticus might be immediately administered.

According to his observation, Dr. Vincent said that children fed on boiled milk were more liable to tuberculosis and the reason for this was the chronic toxemia resulting from the proteolytic action of the colon bacilli.

Treatment by cultures was not, as a rule, indicated in very young infants; in older infants and in children he had obtained the most gratifying results by bacteriological treatment, as the cases cited demonstrated.

The pure cultures were necessarily only prepared in sterilized milk, but they were never given with cooked milk. Milk in its natural condition was the most favorable medium for the lactic organism. The bacteriological examination should be made by the physician. He should know everything at first hand about his case. The cultures must be prepared under his direction and control. Some varieties of the B. lacticus grew slowly at first and some produced larger amounts of acid than others, and these things must be taken into consideration. The patient must be kept under observation and systematic examinations of the dejecta must be made. The bacterial treatment had better be altogether neglected than carried out in a superficial or perfunctory manner.

DISCUSSION.

Dr. William H. Park said that he would like to speak only of the beautiful specimens shown and the excellent work done by Dr. Vincent, but he knew that Dr. Vincent would appreciate the expression of a difference of opinion. One question had been rather in the background in the paper, and that was the danger of using pasteurized or sterilized milk. The New York Health Department had been trying to have all milk, except that which was certified, pasteurized, and if Dr. Vincent's views were correct they would have to reconsider this question. If one took the milk from the cow in a cleanly way and there was no abnormality in the udder, one would not get bacteria. Just that day they had had ten samples of milk from cows that had been certified, and in eight out of the ten there were no bacteria and no streptococci that they could find. In two of the samples there were streptococci, and in one of these they were fairly numerous. Some time ago they had examined the milk of fifty cows, and in most of them there were no streptococci that could be observed. When the streptococci were found the cow was eliminated from the herd. They all preferred that there should be no streptococci in the milk, and Dr. Park said that he did not believe that they added anything to the value of the milk and one was always confronted by the danger of getting a streptococcus that would produce infection. After incubating milk for twenty-four hours the streptococci, according to Dr. Vincent, formed chains; he had found them as diplococci in eight out of ten instances. One did not get the streptococcus lacticus in the milk until other varieties of bacteria began to develop and by that time the milk was unfit for consumption by any infant. All types of bacteria developed until acid increased to such a point as to inhibit their growth, so it was not until they got beyond the point where the milk should be used for food that the bacteria began to supplant one another. In milk pasteurized in the ordinary way the bacteria developed later, the heat blotted out the most sensitive bacteria first, and then the less sensitive, and so on; but if a little raw milk were added to the pasteurized milk the bacteria grew as before.

Dr. Vincent had attacked one of the most important and difficult problems when he undertook the bacteriological study of the feces in the intestinal diseases of infancy. The method of adding milk to the feces and then incubating it gave too mixed a picture to be of any real value. The bacteriological method of distinguishing the colon from the dysenteric bacilli he could not understand, as these bacilli stained alike and grew alike. The pure bacteriology of the subject as presented by Dr. Vincent was rather difficult to understand, but perhaps he had not sufficiently appreciated the clinical side.

Dr. Henry Koplik said that Dr. Vincent deserved thanks for having raised the discussion on the bacteriology of the intestinal diseases of infancy and also for the immense amount of work that he had done in revivifying the old problem of the bacteriology of milk. It was well known that pasteurization did not kill all the bacteria in milk and it would be unfair to expect all to be killed. The fact that fermentation occasionally occurred in milk that had been pasteurized was no argument against the use of pasteurized milk. The object of pasteurization was to destroy the bacteria that would be harmful to the child, and it was well to know the amount of bacteria that could be taken without harm to the infant. Pasteurized milk was meant to be taken immediately and was never intended to be heated and incubated. Dr. Vincent in his paper had gone back to the time of Escherich, when the rôle of the bacteria was everything; but today they were in another era—the school of Czerny and Finkelstein—which taught that it was not chiefly the bacteria, but the food that was given the infant, that was responsible for infection of the baby. In fact, they had not yet decided as to the rôle that bacteria played in the intestinal diseases of infancy. They knew for a certainty, however, that there were certain bacteria that made the baby mortally ill. Whether they could outside the laboratory at the bedside differentiate these forms of infection he could not definitely say. They had all made the attempt and had felt themselves confused. They now knew how to diagnose tuberculosis from a bacteriological examination of the sputum and if Dr. Vincent could give them a similar means of diagnosis in intestinal diseases he would place a powerful weapon in their hands, but for himself, he was not convinced that they had arrived at this point.

Dr. Kerley said that there were a few points not touched on by Dr. Park or Dr. Koplik that he would like to mention. First, they all felt the necessity of help in the treatment of the intestinal diseases of infancy. There was not a man present who had practiced for fifteen or twenty years who could treat his intestinal cases much more successfully than he did years ago. He had been impressed by the fact that Dr. Vincent was trying to work out a plan of treatment on a scientific basis and he had worked very conscientiously for a number of years, so his work was worthy of consideration. But in order to square his claims with the results in this country the different conditions of climate had to be taken into account. In Dr. Vincent's cases he was dealing in almost every instance with the contents of the intestinal tract and not with the intestinal structure itself. The autopsies in this country showed that gross lesions of the intestine sometimes extended through even to the peritoneum. In the matter of mortality, if they took up Dr. Vincent's methods here they would not get his results. In London they did not know what it was to have the hot, humid summers that we had here. The same was true of the Continent; they were dealing with a different kind of lesion. On this account it was not wise to question the results of their colleagues on the other side of the water, and, on the other hand, they should not think the American physician unusually stupid because he did not get as good results as they did. As to the effect of heat upon milk, if he took 50 children and fed them on cooked milk and 50 others and fed them on raw milk, all other conditions being equal, he did not think anyone could see any difference in the two groups of children.

Dr. L. E. La Fétra said that it had been the privilege of Dr. Kerley and himself to visit the Babies' Hospital and to see Dr. Vincent's work last summer, and it was most interesting to see the wards and the laboratory in such close communication. If any practical and reliable method could be developed of making a diagnosis in these cases that would form a basis for treatment they should take advantage of it. It was possible that Dr. Vincent's excellent results were due to his careful observation and large clinical experience as much as to his laboratory work. It seemed that the dietetic part of his treatment was the important factor because of the reason mentioned by Dr. Koplik—he was not dealing with the severer types of intestinal disease. Dr. Vincent used boiled milk, Eiweissmilch, etc., and it seemed that he might have obtained his good results without the bacterial treatment.

Dr. La Fétra did not feel that Dr. Kerley really thought that they could not treat these conditions today any better than they did fifteen or twenty years ago. He felt that they could do much better than they did years ago, because they now had so many different kinds of milk and of milk sugars and so many methods of using them.

Dr. William P. Northrup said he did not wish to discuss the paper, but to thank Dr. Vincent. They should all appreciate Dr. Vincent's earnest effort to find an accurate method for the diagnosis of these conditions which would form a basis for their treatment.

Dr. Ralph Vincent, in closing the discussion, said that he had been using this method himself and had found it of so much assistance that he would not attempt to treat these diseases without it, and those who were working with him felt in the same way. He was not at all disturbed by the bacteriologist calling his method "rough and ready." They had employed a method to meet the indications. When the milk was perfectly fresh there might be no streptococci, but they were invariably present after eight hours. Dr. Park had gone from the time of milking to twenty-four hours afterward when all the organisms were diplococci. At the end of eight hours he would find them in chains, and he hoped that Dr. Park would try examining the milk at intervals of four, eight and twelve hours. He had found the streptococci growing luxuriant in fresh milk from healthy cows and they had found the same thing at Johns Hopkins and had rejected the cows; if they carried out this policy they would probably have to condemn every milk. They did not find chains at the time of milking. Dr. Vincent believed that the natural diet of the infant was raw milk. When Dr. Koplik said that these diseases were dependent on food he was correct. Of course if the food was without lactose the lactic bacilli would not develop. He had heard that 50 per cent. of the cases of intestinal diseases in infants in this country had blood in the stools; such a condition was quite unusual with them. Gross lesions of the intestines were rare. Sometimes they met with a few such cases.

Dr. Vincent said he was prepared to learn as well as to teach, and it would be a good thing if observations were made both here and in England and the results compared. In answer to Dr. La Fétra's question as to the part played by the cultures of lactic bacilli in the treatment of these conditions, he could only relate his experience. In cases in which they gave cultures the condition would clear up and after three weeks in some instances there had been a relapse, when they would again give cultures, and immediately after such treatment the case would be improved again. The natural diet was not sufficient in all cases and the cultures played an important part.

THE PHILADELPHIA PEDIATRIC SOCIETY.

November 11, 1913.

THEODORE LE BOUTILLIER, M.D., PRESIDENT.

CONGENITAL MALFORMATION.

DR. ALICE WELD TALLANT reported this case. (See p. 45.)

DR. LE BOUTILLIER remarked that he had not seen many cases exhibiting so many deformities and he felt sure that few had been noted as interesting as this case of malformation.

DR. J. P. CROZER GRIFFITH spoke of the very great frequency with which one congenital malformation was combined with several others in different parts of the body. He recalled a case seen with Dr. Target several years ago, which he thinks was reported before this Society, in which there was a large number of malformations present, although hardly so numerous as in this one of Dr. Tallant's. A few years ago he had a very interesting instance of hernia into the umbilical cord of large size, combined with congenital malformations.

UNILATERAL HYPERTROPHY OF THE LEG.

DR. JOHN SPEESE reported 2 cases of congenital unilateral hypertrophy. The first case occurred in a boy of five, in whom hypertrophy of the frontal and temporal bones was noted soon after birth. The growth increased progressively until a distinct protrusion is now present and the circumference of the skull on the affected side is 2 cm. greater than the opposite half. The hypertrophy is entirely confined to the bone, the soft parts being uninvolved. This case is of particular interest because instances of this type are usually found in patients who are mentally deficient and have other congenital defects, whereas this boy is entirely normal in every other respect. The second case was a girl of ten years. Her parents state that an enlargement of the great toe of the right foot was noted two months after birth, continuing uninterruptedly since. Examination discloses an overgrowth of the soft tissues about the knee, calf of the leg and great toe. The right leg is one inch longer than the left, and the knee and calf are two inches greater in circumference. From toe to heel the right side is one inch larger than on the left side, due to overgrowth of the toe, which is several times greater than the left toe. Amputation of the toe was performed and sections of the soft tissues show overgrowth of the fatty tissue and rarefication of the bone structure. The hyperplasia about knee and calf is also presumably due to overgrowth of the fatty tissue. The etiology is not clear, as this patient is also normal in every other particular and has shown no recurrence of the hypertrophy since operation, as has been reported in several instances.

Dr. J. Torrance Rugh said that he could add but little. The etiology remains conjectural. He had seen a similar case, which he had exhibited before this Society a year ago, with congenital hypertrophy up to the knee. In this case the subcutaneous fat had hypertrophied also. The distribution of congenital hypertrophy is peculiar in that it may involve any part or parts of the body. Dr. Rugh also referred to a relative, an adult with hemihypertrophy. In these generalized cases operation is impossible. Normally, the human body consists of two asymmetrical halves. In these cases the natural asymmetry becomes more marked. No individual is perfect.

Dr. Le Boutillier referred to another case of hemihypertrophy, observed at the Woman's College Hospital. Here, too, the increase in size was due to fat hypertrophy alone.

BACTERIOLOGICAL DIAGNOSIS OF ALIMENTARY DISEASE.

Dr. Ralph Vincent, of London, by invitation, gave a lantern demonstration of photomicrographs, illustrating the bacteriological diagnosis of alimentary disease in the infant and child. The study of the growth and action of organisms in milk in normal and abnormal conditions was essential to the comprehension of the biochemical processes occurring in the intestine. The organisms were classified according to their growth and action upon milk: (1) Organisms producing lactic acid, but not producing gas, streptococcus lacticus and bacillus lacticus; (2) organisms producing lactic acid, carbon dioxide and alcohol, colon group (bacillus acidi lactici, bacillus lactis aerogenes, bacillus coli communis, etc.); (3) organisms growing in pasteurized milk, but not in raw milk, bacillus putrifidus and bacillus aerogenes capsulatus (Welch); and (4) organisms growing in milk that has been boiled (212°F.) but not in raw milk, bacillus subtillis, bacillus mesentericus, etc. The governing condition in the intestine of the healthy infant was the growth and action of the streptococcus lacticus. This organism was extraordinarily powerful in inhibiting and controlling the growth of all other organisms. This was well seen when pure raw milk was incubated at 38°C. for from eight to twenty-four hours. As a rule, this organism was found in practically pure culture. If the milk was pasteurized before incubation a wholly different microscopical picture was seen. The effect of an abnormal or unnatural diet was seen in the change in the intestinal flora. As the streptococcus lacticus failed to act, owing to the abnormality of the media, so the other organisms came into action, with the result that unhealthy or pathological conditions arose in the alimentary canal. Dr. Vincent then discussed the bacteriological diagnosis by means of direct microscopical examination of the intestinal dejecta and of cultures in milk made from the dejecta. The number and dominance, or otherwise, of the colon organisms constituted a valuable diagnostic criterion, and Dr. Vincent had designed a method of differential staining by which the colon organisms were stained light blue and the lactic organisms a deep purple.

Dr. John A. Kolmer said that milk after pasteurization must be kept at a low temperature, otherwise much harm is done by the removal of lactic acid organisms which ordinarily inhibit putrefactive changes in milk, but did not suspect that organisms of the subtilis group were so important in the bacteriology of milk because they are frequently found in milk and feces under apparently normal conditions. In his experience with bacteriological examination of feces of children suffering with ileocolitis the condition was found mainly due to streptococci or to a dysentery-like organism in association with the colon bacillus.

Dr. Harry Lowenburg said that, if Dr. Vincent's ideas as to the etiology of the gastrointestinal diseases of infants represent the view held by the English medical profession, it would be interesting to observe a consultation between a representative English practitioner and a pediatrist fresh from the school of Finkelstein. The Germans almost entirely disregard the important rôle played by bacteria and insist upon the influence of primary sugar fermentation bringing about protein and fat decomposition. The Englishman would perhaps eliminate milk entirely from the diet, while the German would feed large amounts of protein and eliminate sugar and fat. The German regards the process as one of food chemistry entirely, the Englishman as an infection. While England has withstood the influence of the German school, many of us in the United States have espoused the German ideas. To the earnest observer, anxious for the truth, the situation is somewhat puzzling and the outcome interesting.

DR. J. CLAXTON GITTINGS said that the infrequency of the ileocolitic type in England in comparison with its common occurrence in this country must be of some significance and probably can be explained chiefly by differences in the milk, with the consequent effect upon the bacterial flora. In Dr. Gittings's service at the Children's Hospital a morphological examination of the fecal bacteria in the infants' stools has been made routinely since August 1st, and has shown in almost all cases that the Gram negative coliform type predominate. This information, therefore, has furnished no trustworthy indication either for diagnosis or treatment. With improved technique, suggested by Dr. Vincent, different results may be obtained. Testing the reaction of the stools often fails to afford information of value, since an excess of alkaline mucus from the lower bowel may neutralize moderate degrees of acidity.

DR. S. McC. HAMILL did not quite understand Dr. Vincent's remarks regarding the possibility of the transmission of tuberculosis from the cow to the infant through the medium of milk. He would like to ask whether Dr. Vincent would deny such a possibility.

DR. VINCENT, in closing the discussion, said that he had found the bacillus subtilis in practically all samples of milk. If a milk is abnormal, as milk is after having been boiled, the bacillus subtilis acts in the intestines. When these bacilli or colon bacilli become proteolytic, they are disease-producing organisms. Their presence and action result from abnormal diet given the child. Dr. Vincent failed to understand the German point of view. While high proteids may be of value in some cases, where acid organisms predominate, he refuses to use any routine method of feeding, but finds the food best indicated for the individual child. The German school at present is more dogmatic than scientific. The incidence of tubercle bacilli in children is determined, as a rule, by some condition other than the tubercle bacillus itself. If a child constantly takes much infected milk there is a possibility of the infection arising in the alimentary tract. But in most cases it enters by the respiratory tract and reaches the intestines secondarily through the blood stream. The bacilli of the "bovine" type are human bacilli, virulent enough to affect the cow. Such "bovine" bacilli have been found in infants who have never tasted cow's milk.

FAT IN MOIST FECES.

Dr. Gordon J. Saxon, by invitation, demonstrated a new method for the differentiation of fat, fatty acid, and neutral fats in moist feces.

Dr. Charles A. Fife appreciated that this method decidedly abbreviated older methods of separating fats. But this method is intended for careful scientific work, not for ordinary clinical work. The centrifugation method of Cowie and Hubbard, which resembles the Leffman-Beam process for separating the fat of milk, takes only a few minutes and is, therefore, more applicable for clinical use. This method, however, utilizes small amounts only, thus allowing errors in technique to become multiplied in computation. Another objection is that the total fat only can be determined by these methods, which Dr. Fife described. He thinks it possible to make sufficiently accurate estimations of the neutral fat, fatty acids and soaps by the microscope, with acetic acid and Sudan III. For accurate, scientific work, however, Dr. Saxon's method deserves commendation.

Dr. Saxon added that he had found errors of from 3 to 12 per cent., when using the Cowie method for determining the estimation of the total fat in the feces.

THE QUANTITATIVE DETERMINATION OF THE TOTAL FATS IN MOIST FECES.

Dr. Gordon J. Saxon.—Mix the stool thoroughly in an aluminum evaporating dish until the whole is hemogeneous, then weigh. Select a sample and again weigh. The difference in the weights will be the weight of the specimen selected.

Place the specimen in a 100 c.c. glass-stoppered, graduated cylinder, add 3 c.c. concentrated hydrochloric acid in 20 c.c. water, after which bring the total volume up to 30 c.c. with water and add 20 c.c. ether. Shake vigorously for five minutes, after which add 20 c.c. 95 per cent. alcohol, and again shake five minutes. Stand aside for ether to come to top. When the ether has risen blow it off in the manner that water is blown from a wash bottle. The submerged end of the delivery tube should be bent upward in order that the subjacent stratum be not disturbed.

Dilute the thin layer which remains with 5 c.c. of ether. This is accomplished by running the ether down the inside walls of the cylinder. This is blown off and the dilution process done in all five times. Another 20 c.c. of ether is added and shaken five minutes. After settling is complete blow off the ether layer as before.

The beaker containing the fatty ether is now placed over an electric light bulb or on a safety water bath and the whole evaporated to dryness. Add 50 c.c. low boiling (below 60°C.) petroleum ether and allow to stand over night.

Filter through a cotton plug in a small funnel into a weighed tall 100 c.c. beaker, in which also collect the washings.

Evaporate to dryness, dry at 90°C. for four hours, dessicate and weigh. The result will be the neutral fats, the fatty acids of the soaps and the free fatty acids.

The contents of the beaker are now dissolved in 50 c.c. of boiling benzol and titrated with a decinormal sodium alcoholate, using phenolphthalein as an indicator. Each c.c. of the decinormal solution used represents 28.4 milligrams of stearic acid.

The calculated result is subtracted from the gravimetric determination and the result is the weight of the neutral fat.

December 9, 1913.

THEODORE LE BOUTILLIER, M.D., PRESIDENT.

PRIMARY SPLENOMEGALY.

DR. S. McC. HAMILL presented this boy, aged four and one-half years. His father was said to have had "spleen trouble." The child's face was so swollen ten days after birth as to close his eyes. There were no other symptoms and the physician states that the condition was not infectious. He had pneumonia at six months. A few weeks after birth anemia was noted, which had persisted. At fourteen months he had an exacerbation, hemoglobin dropping to 24 per cent., and he was desperately ill. He has had a number of acute attacks since, accompanied by an elevation of temperature, sometimes to 104° F. He vomits with attacks and has continued vomiting for days, and may be nauseated between attacks. The vomiting may have been cyclic, the anemia being the result of the vomiting attacks. His last vomiting attack was in October, 1912. Last April, after three hours' sleep, he awakened with loss of power in his left arm and complete paralysis of the left leg. He was not unconscious. He had fever, was restless and wakeful. Shortly afterward, following a negative Wassermann, he was given salvarsan intravenously, with alarming symptoms following. Subsequently he had four doses of salvarsan or neosalvarsan by rectum. There was decided reaction after the two last, given July 19th and August 21st. Marked improvement of the paralysis, blood picture and general condition followed. Physical examination shows a very large, firm, smooth spleen, extending down to the iliac crest and to the median line to the right; very slight enlargement of the liver and almost complete absence of enlargement of the superficial lymphatic glands. Kidney secretion is much diminished. Bile and urobilin were not present in the urine. He is cheerful and mentally active, but suffers physical fatigue from slight effort. His nights are restless. Blood counts showed 1,360,000 erythrocytes, 49 per cent. hemoglobin, and 7,100 leukocytes; differential count gave lymphocytes 68 per cent., large lymphocytes 4 per cent., transitionals 1 per cent., polymorphonuclears 26 per cent., eosinophiles 1 per cent., basophiles none, myelocytes none, two normoblasts in 100 leukocytes, numerous macrocytes and microcytes, few poikilocytes. The principal features of this extreme anemia were the low leukocyte count and the excessive mononuclears. There is no jaundice now, but the mother states that the child's skin has been very yellow at times. The persistent low leukocyte count, absence of jaundice and marked enlargement of the spleen lead to the diagnosis of primary splenomegaly. The early development of the anemia suggests that the anemia may be congenital, antedating the splenic enlargement. If the anemia was primary, this fact, together with the increase in the number of mononuclear cells, makes one consider the possibility of pseudoleukemia infantum, but the leukopenia, in the presence of the extremely grave anemia, makes this diagnosis untenable. Dr. Hamill was inclined to consider this case one of primary splenomegaly.

AMYLOID DISEASE OF THE LIVER.

Dr. Hamill also showed a Russian boy of nine. He was supposed to have had scarlet fever at the age of four. He was brought for a deformity of his arm. This was found to be due to a much contracted left chest, compressing the lung, which was pushed into the upper part of the chest, giving all signs of consolidation. The feature of interest was the enormous enlargement of the liver, which occupied more than three-quarters of the abdominal cavity. Its left lobe extended over to the left lateral surface of the chest and its notch was felt to the left of and below the umbilicus, while the right lobe extended downward almost to Poupart's ligament. The liver was firm, surface smooth and edge sharp. Spleen was palpable, firm to touch, pushed below the margin of the ribs after full inspiration. There was no tenderness on pressure and no other masses were found. There was moderate enlargement of all superficial lymphatic glands, with marked clubbing of fingers and toes. The child was undersized, very anemic and emaciated. He had had a persistently intermittent temperature. When first observed, blood examinations showed moderate increase in leukocytes, with excess of polymorphonuclears. Recently he has more marked leukocytosis of the polymorphonuclear type and severe secondary anemia. He never had any pain, jaundice or ascites. He has had no diarrhea. Albumin, in varying amounts, has been frequently found, but no casts. Cutaneous tuberculin test was mildly positive; Wassermann negative. The diagnosis of amyloid disease was based on the blood picture, indicating an infection; the confirmation of this infection by the chest deformity, which probably indicated pre-existing pyemia; the absence of jaundice and ascites; and the irregular type of fever.

Dr. E. B. Krumbhaar discussed the first case, which he considered to be a true case of primary splenomegaly, probably of the Minkowski-Chauffard type. The chronic enlargement of the spleen, probably from birth; the anemia, presenting marked changes from month to month; and the suggestive history of a similar condition in the father and grandfather all point strongly to this hereditary condition. Following Chauffard's aphorism that these cases are more icteric than sick, his evident sick state and the absence of jaundice are atypical, but there is some evidence that during previous attacks jaundice has several times been present. Examination of urine at this time might also show excess of urobilin. An examination of the blood to determine the resistance of the red blood cells to hypotonic salt solutions of different strengths would be of value in differentiating this type from other forms of splenic anemia. If the fragility of the red cells was found increased, it would be strong evidence in favor of the Minkowski type. If this diagnosis is correct, then the question of splenectomy at once arises. Just as in the early stages of Banti's disease and in the acquired form of this disease (Hayem-Widal), and, in fact, wherever undue hemolysis is proved, a large percentage of cures has resulted from splenectomy.

CARIES OF LUMBAR SPINE.—OPERATION.

Dr. J. Torrance Rugh showed a boy of fourteen, who first developed caries of the lumbar spine at three years. He was treated almost from the beginning. Very early large psoas abscesses developed upon each side, disappearing under thorough fixation of the entire body in plaster. But they reappeared when a brace was applied and finally had to be opened. These openings healed, but later two sinuses formed and these are still discharging. He went without brace or support for four or five years, but one year ago began to show signs of activity of the carious process. Operation was performed January 28, 1913. It was purposed to do Hibbs' operation to secure ankylosis of the posterior segment of the spine, but pus was found about four or five spines when uncovered in the attempt to strip the periosteum from the spinous processes. Not wishing to risk the entire process, each one was split in half and one-half was cut off at the base and turned down in contact with the process below it. The pus was wiped away and the periosteum sewed over to maintain position. The wound was closed without drainage and a plaster jacket applied. Recovery was uneventful and improvement has been steady; he is now anxious to go without his cast. The old sinuses are still discharging very slightly, but his health is improved and all signs point to the success of the operation. This method of operation was first used by Albee before he began bone-transplantation.

SEPARATION OF THE TIBIAL TUBERCLES.

Dr. Rugh showed another boy, aged fifteen, first observed November 3, 1913. He complained of tenderness on the anterior surface of each knee. This had been present for five or six months and gave him much annoyance. He was sturdy and active, growing rapidly. Examination showed marked enlargement just below the patellæ and tenderness over these areas. He complained that the knees hurt after walking or exercising. The diagnosis of separation of the tibial tubercles was confirmed by the X-ray. He was directed to rest and ichthyol ointment was applied. In two weeks the tenderness had all subsided. The case will be watched and if there is no attempt at union later an operation will be performed to fix the tuberosities.

Dr. T. A. O'Hara said that the Albee operation had proved successful in over 30 cases in the Orthopedic Department of the University of Pennsylvania Hospital. So far as he knows, the Hibbs operation has never been attempted there.

Dr. Rugh added that this was the first type of operation done by Albee for Pott's disease and was indicated in this instance in place of bone grafting because of the suppuration along the spines.

OSTEOGENESIS IMPERFECTA.

Dr. H. Lowenburg showed an infant four days old. Labor was unusually easy, as the baby was undersized. Placenta was calcareous. It was noticed that crepitation occurred in nearly all the long bones. An X-ray picture exhibited showed fractures of all the long bones. That these fractures were intrauterine was emphasized by the fact that the one upon the right humerus showed considerable callus which could not have formed after birth during four days. This might be an interesting medicolegal point. The case will be reported in detail later.

Dr. Rose Rubin said that delivery was quite easy. She first noticed crepitation of the arm after the posterior shoulder was delivered, even before the entire body was born. Aside from the calcareous degeneration of the placenta, there was nothing unusual about delivery. The mother gave a history of having had one child with club-foot. She married her first cousin, but has four other healthy, normal children. When she was about six months pregnant she fell down one step, but never noticed any ill effects from the fall. There is no specific history.

Dr. J. P. Crozer Griffith said that his attention had been directed to the subject of fragilitas ossium a number of years ago. He observed a child nearly three years old, who was found a few days after birth to have both femora fractured, although labor had not been difficult. From that time on he developed fractures of various bones from the slightest cause. It was estimated that in his short life he had had from seventeen to eighteen. Otherwise he was normal. He was kept in a reclining position upon a stretcher, since experience had shown that he was liable to fracture some bone if he sat up or made any unusual movement. Dr. Griffith had collected and published all reported cases at that time; since then he had seen additional cases. The relationship of idiopathic osteopsathyrosis to other affections of the bony system, such as chondrodystrophy fetalis and osteogenesis imperfecta, is to be considered. Certainly there is a very close relationship. The first one refers to an unusual tendency of the bones to fracture; the last one designates an imperfect formation of bone and would include such cases as those in which the child is born with the bones of the head excessively thin or with calcareous matter deposited imperfectly in places. He recalled one such instance where the head during birth was supposed for a moment to be the amniotic sac; after birth the vault of the cranium suggested more a soft-shelled egg than anything else. The two conditions are often combined, for such cases as the last mentioned may exhibit imperfect development also, with fractures of the long bones, and may continue to exhibit fragility later in life. Or children may be born, like the case shown this evening, the imperfect formation of the long bones being present without the thinness of the skull. The nature of the lesions present is far from understood and there has been much discussion over it. It would seem likely that the change is not always the same. Certainly the explanations given are to an extent contradictory.

SYPHILIS.

Dr. Theodore Le Boutillier showed 3 children. The first, a baby of two months, showed large liver and spleen, and hemorrhages from the mucous membranes. It had also had snuffles, skin eruptions, and great weakness. The baby has done well upon inunctions and calomel internally. Dr. Le Boutillier considers it the worst case of hereditary syphilis he has seen, and conditions have cleared up remarkably well. The second was a boy of seven, under observation since one month old. At four years he had an abscess over the right tibia, which was opened. Two years later marked ptosis of the right eyelid developed, with strabismus. Wassermann was markedly positive and he was given salvarsan; ptosis improved in a month. Two subsequent injections of neosalvarsan were given, and Wassermann is now negative. The father's chancre dates eleven years before the child's eyes became affected. He was under treatment three years and then married; four years later this boy, the only child, was born. Wassermann of father markedly positive; of mother negative. The third case was a boy aged five, first seen when six weeks old. He had snuffles and a skin eruption. His liver was enlarged. Treatment was kept up two years at that time. Now he is backward mentally, has a moderately spastic gait, markedly increased knee-jerks and ankle clonus. The case is clearly syphilitic myelitis.

Dr. Mary Buchanan saw the second child. A von Pirquet was negative. As ptosis, when not traumatic, is generally specific, a Wassermann was done and was strongly positive. Two decigrams of salvarsan caused the disappearance of the ptosis in three weeks. Inunctions and KI were continued for years and all power returned except convergence. The ptosis recurred later, followed by complete third nerve paralysis. Upon mercury and KI the ptosis again disappeared. Now, two years after the first attack, there are still dilatation of the pupils, deficient accommodation and divergent squint. The unilateral ptosis alone suggested syphilis.

Dr. D. J. Milton Miller, of Atlantic City, N. J., asked if the second case might not be syphilitic meningoencephalitis. It suggested a cortical lesion now. Dr. Miller referred to having observed a somewhat similar case, an infant of twelve months, who had increased reflexes and spastic symptoms in all four extremities. Autopsy revealed a diffuse meningoencephalitis of probable specific nature. Dr. Le Boutillier's patient had, it is true, no arm symptoms, but the strabismus showed that now, at least, there was an involvement of the cerebrum.

Dr. Le Boutillier said that there may be a cortical lesion.

The strabismus was not present when he last examined this boy, about four weeks ago. The one symptom was marked spasticity of both legs. The family history shows alcoholism beside syphilis.

LATERAL DEVIATION OF THE SPINE.

Dr. T. A. O'Hara showed a boy of fifteen years with possible spondylitis.

RINGWORM OF THE SCALP CURED BY X-RAYS

Dr. Frank Crozer Knowles exhibited 2 children. The first showed the depilation resulting from exposure to the X-rays, in the cure of ringworm of the scalp. The second presented typical scutulæ of favus. He explained the method of Sabouraud and Noire, using pastille indicators. He also referred to a number of cases of ringworm of the scalp treated in this manner, both by himself and by Dr. Ludy, following the technique used in France and England.

Dr. W. N. Bradley asked the early differential diagnosis between favus and ringworm of the scalp.

Dr. Knowles stated that favus was found in Russia especially. It is due to a vegetable fungus, showing mycelia and spores under the microscope. It starts with a yellow, raised lesion, increases in size and is followed by a scar. It is not so contagious as ringworm. It is a fatal disease in rats and mice.

ENDOSCOPIC EXAMINATION OF INFANTILE CERVIX AND VAGINA.

Dr. John F. Sinclair demonstrated a method of examining the infant's cervix and vagina endoscopically. The method is of service as a prophylactic measure. During the current year he has examined 83 babies by this method. Both vulvar and vaginal smears were taken routinely and examined bacteriologically. Careful notes of vaginal and cervical conditions were kept. Nineteen per cent. were found to be infected with gonococcus upon admission to the Babies' Hospital, or to present highly suspicious evidence of such infection. The early recognition of the infectious agent is of immense importance in instituting proper prophylactic measures. Over 21 per cent. of the cases which were positive or highly suspicious upon admission would have escaped detection without the use of the endoscope.

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. CHARLES E. FARR. DR. J. S. LEOPOLD.
DR. C. D. MARTINETTI.

MEDICINE.

WOLFF, S.: ON THE CAUSES OF SUMMER DIARRHEA OF INFANTS. (*Jahrb. f. Kinderhk.*, Vol. LXXVII., No. 5.)

Opinions seem divided as to whether summer diarrhea is caused by altered milk or by the external elevation of temperature. A premature infant two months old was removed from her incubator. This was sufficient to cause a temperature of 42°C. and violent diarrhea. Placed once more in its accustomed surroundings the child, without medication or change of food, rapidly got well. C. D. MARTINETTI.

JÖRGENSEN, GUSTAV: SALT FEVER IN INFANTS. (*Monats. für Kinderhk.*, October 15, 1913, p. 386.)

Samelson, and Bendix and Bergmann have shown that if freshly distilled water is used in giving subcutaneous infusions no fever is observed. If distilled water is used that has been standing for some time fever is regularly seen. These authors did not show, however, what the cause of this fever was. Jörgensen found that the distilled water that had been standing for some time contained bacteria, while the freshly distilled water was sterile. Fever was observed when the distilled water was used which contained bacteria, while no fever was observed when the sterile water was used. The fever observed in these cases is, according to Jörgensen, surely of bacterial origin. In giving saline infusions to infants one should be certain that the water used has been freshly distilled. JEROME S. LEOPOLD.

PETRUCCI, R.: INTERMITTENT FEVER FROM CYSTITIS. (*Policlinico,* April 28, 1912.)

A girl of five presented for three weeks signs of intestinal derangement. Several days later, while convalescing, an intermittent daily temperature of 39°C. was observed, preceded by a chill. No other symptoms. Quinin medication gave no results. Pain was observed during urination, and urine examination showed albumin, pus and active coli bacilli. A urinary disinfectant, helmitol, rapidly cleared up all symptoms.

A girl of four was subject to frequent attacks of indigestion. High temperature was observed every fourth day. A physical examination revealed nothing. Urine was scanty and frequently emitted, and was found dense, full of pus and epithelial cells and bacilli. Fifteen grains of helmitol daily were given with excellent results. C. D. MARTINETTI.

SURGERY.

MURALT, E. V.: MULTIPLE CANCER OF THE INTESTINE IN A BOY OF THIRTEEN. (*Archiv. für Verdauungs-Krankheiten,* October, 1913.)

Carcinoma in children is so rare that every case deserves careful study. Muralt's case was in a boy only thirteen years old, who had suffered for four years from what seemed to be tuberculous peritonitis. Finally symptoms of intestinal obstruction supervened and a laparotomy was performed, but the child died on the second day. At the autopsy the whole intestinal tract was found studded with cancer nodules, of which the largest were in the ascending colon. Microscopic examination revealed typical cylinder cell carcinoma in all of the lesions.

CHARLES E. FARR.

HERTZLER, A. E.: TREATMENT OF INGUINAL HERNIA IN CHILDREN. (*Journal of American Medical Association,* November 22, 1913, p. 1,879.)

Hertzler concludes that (1) all inguinal hernias in infants are due to persistence of the processus vaginalis, (2) inguinal hernias are not cured by the truss and rarely recover spontaneously, (3) surgery is permissible in all cases if the facilities are of the best and the operator is skilful. Operation is urgent if the hernia protrudes persistently or the child is annoyed greatly by retentive appliances which lessen his activities or produce excoriations. Operation is demanded if the hernia is irreducible or strangulated. (4) Because of the difficulty of maintaining an aseptic field after operation it is wise conservatism to wait until the child has reached such an age as will enable him to lend his coöperation, that is, until the age of four. (5) Palliation is demanded when organic disease is present or adequate facilities for operation are not at hand. CHARLES E. FARR.

THERAPEUTICS.

BEREND, N.: THE MAGNESIUM SULPHATE TREATMENT OF SPASMOPHILIC CONVULSIONS. (*Monats. für Kinderhk.*, October 6, 1913, p. 269.)

Berend gives a very excellent review of the literature on tetany, and then describes his new treatment with magnesium sulphate. It has been definitely shown that in tetany there is a disturbance in calcium as well as in magnesium and phosphor metabolism. Berend gave 0.20 grams of magnesium sulphate for each kilogram of body weight in infants. He used an 8 per cent. solution, and of this he injected 15 to 20 c.c. subcutaneously. No toxic symptoms developed, although this dose was given daily in many cases. No infiltration resulted. When given by mouth no good results were seen.

Berend treated 25 cases of tetany with this magnesium sulphate solution. Good results were seen from one-half to two hours after injection. The electrical irritability was diminished, the laryngospasm, the carpopedalspasm, and the convulsions were all much improved by this medication. This treatment rarely had to be given for more than four or five days. After the second day a preparation of phosphor and cod-liver oil was added. The best results were obtained if the infants were kept on a diet poor in salts. Breast milk was given when possible.

According to Berend, cases of nephritis and meningitis should not receive this treatment.

No good results were obtained in cases of epilepsy, chorea, or pyloric spasm.

JEROME S. LEOPOLD.

BOOK REVIEWS

DISEASES AND DEFORMITIES OF THE FOOT. By JOHN JOSEPH NUTT, B.L., M.D., Surgeon-in-chief, New York State Hospital for the Care of Crippled and Deformed Children; Surgeon, Sea Breeze Hospital; Assistant Attending Surgeon, in charge of Orthopedic Cases, Willard Parker Hospital; Member of the American Orthopedic Association. Illustrated. Pp. 293. New York: E. B. Treat & Co., 1913.

Dr. Nutt's book has such excellence that one is almost inclined to wish that it were a larger work on orthopedics.

The general practitioner who reads this treatise on the diseases and deformities of the foot will realize how much of the treatment of these troubles he may, even without orthopedic apparatus, treat successfully, and how much comfort he may give to sufferers whose ailments he is too much inclined to put down as being due to chronic rheumatism. For the foot has in it more potential suffering than any portion of the body from causes which are in themselves not dangerous and too few are the men who know, or who want to know, how to recognize and cure weak foot, flat foot, Shaffer's foot, anterior metatarsalgia, etc., which they might well do.

In discussing the anatomy and physiology of the foot Dr. Nutt is clear and definite without being too detailed, and his descriptions of the manner in which various abnormalities may arise from faulty use of the feet is readily understood and very enlightening. The chapters on Treatment of Congenital Club Foot, Infantile Paralysis and Tuberculous and Gonorreal Diseases are full, yet brief, and he has found space for the consideration of some of the minor ailments and a consideration of the principles underlying a choice of footwear.

Throughout the book is pervaded by a nice idea of proportion and wholesome common sense.

MEDICAL AND SANITARY INSPECTION OF SCHOOLS: FOR THE HEALTH OFFICER, THE PHYSICIAN, THE NURSE AND THE TEACHER. By S. W. NEWMAYER, A.B., M.D., In Charge of the Division of Child Hygiene, Bureau of Health, Philadelphia, Pa. Illustrated with 71 engravings and 14 full-page plates. Pp. 311. Philadelphia and New York: Lea & Febiger, 1913.

A book of great value to all pediatrists, whether they be school inspectors or not. Besides the interesting accounts of the methods of school inspection and methods of recording the results of inspection, there is much that is suggestive as to methods of inspection of children in private practice and it sets standards to which all pediatrists should come.

From the standpoint of civic concern, it gives the latest ideas as to the needs and the benefits to the community from school inspection, both as a preventive and corrective agency. THE ARCHIVES commends this book most heartily to its readers.

ARCHIVES OF PEDIATRICS

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EDITORIAL.

ST. JOHN'S GUILD.

It must be that the good people with means to give do not know about the St. John's Guild and its work. For this winter the Guild needs money to carry on this work, wonderful as it is!

For forty years the Floating Hospital of the Guild has taken mothers and babies out upon the waters of New York Bay away from the blistering heat and the noise and distress of the streets of the city, for cool, restful, invigorating days. How many lives have been saved, how much happiness has been abundantly scattered, who shall say! Let us go in fact or fancy some summer morning, when by breakfast time the sidewalks, still warm from yesterday, are heating up again, and the sun shining red through the smoky atmosphere betokens another day of prostrating heat and humidity, to the wharf where the *Helen C. Juilliard,* clean and airy and spacious, waits to take its thousand mothers and children and babies to the Seaside Hospital at New Dorp. Crowds? Yes. Eager faces, happy in anticipation of the holiday, remembering, perhaps, the golden day of last year, are scattered among the many that are wan and pale and feverish. Noisy callings to and fro of the exuberant well rise with the fretful cry of the sick babies turning restlessly in the arms of their tired mothers. Here some little boys are jumping up and down in their hurry to get aboard; there is one in tears because for some reason, scabies, probably, he may not go. The big policeman towers above his diminutive fellow citizens and as the throng moves toward the gang plank with difficulty keeps them in order. Then, aboard, the long slow ride on the water, when mothers may be relieved for a time of their sick ones, when cooling baths turn out sweeter smelling youngsters and a good dinner heartens all!

There is nothing just like this work anywhere else in New York. Last summer 57,887 mothers and children and babies were carried by the *Juilliard,* and in its near half century of work over 1,500,000 mothers, children and babies have been cared for in the Guild hospitals. Down at New Dorp there are well-designed and equipped hospital buildings with a capacity of 400 persons, and here in the summer the sick children and babies are kept until with care and coolness and quiet they shall have recovered. There is bathing for some, there are playgrounds for others; there are the sick wards and the convalescent wards.

The positive side of this is striking. Look at the negative side. Take away from New York St. John's Guild and the Floating Hospital and the Seaside Hospital. Where then shall we find room for every summer's sick babies with our available hospitals already crowded? How many of the well children may become ill just for lack of this day on the water! How many lives changed for want of just that glimpse of a cleaner, fresher, more joyous existence than their garbage-strewn pavements or their night-crowded fire-escapes can give them!

You who have the hills in your hearts, or who have desired the sea—

> "the sight of salt water unbounded"—

think what even your well-filled lives would become if all remembrance of these were taken away or had never been. Think of what it may mean in citizenship to some child who knows only his own alley to see the sun shining upon wide sweeps of clouds, to hear the water splashing against the sides of the boat, to smell the salt fragrance of the cool breeze and to behold Liberty reigning over the whole summer scene! Does New York need the St. John's Guild? Is there but one answer?

There are two other points of service to consider. The winter convalescent service established this year fulfills a requirement which all hospitals recognize and welcome, and its service is unique. The Floating Hospital no longer floats on summer seas, but moored to a dock serves to accommodate cases of whooping-cough for which there is no hospital and gives the city what it has not supplied for itself and what it needs badly.

The Guild asks for twenty-five thousand dollars—*now*. The cost of five automobiles will keep this work going through the winter. Surely out of the thousand that crowd Fifth Avenue daily five could be spared if their owners would; and many is the owner there who has two—or ten.

There must be good people in New York who will want to help if they can but know the need.

FLOATING HOSPITAL--"HELEN C. JUILLIARD"

ORIGINAL COMMUNICATIONS

THE ST. JOHN'S GUILD OF NEW YORK CITY.

BY W. MORGAN HARTSHORN, M.D.,
New York City.

The work of the St John's Guild places it in an unique position among the charitable institutions of New York City. Its Floating and Sea Side Hospitals, operating during the summer months, care not only for sick babies, but furnish to the mother and to other children in the family under six years of age the benefits derived from rest, good food and sea air.

Founded forty-seven years ago in the old St. John's Chapel of Trinity parish, its work at first consisted of district visiting in the fifth and eighth wards.

During the hot summer days of 1873 the sympathy of its members was aroused by the condition of newsboys on the streets, and two excursions on the bay were arranged for them and their mothers. These were so successful that eighteen trips were made the following summer. The Guild then withdrew from the direction of Trinity parish and became non-sectarian in character.

In 1875 a barge was purchased, and during that summer 22,834 persons were carried on its tri-weekly trips. These were soon increased to four and later to six a week, the present number. The Sea Side Day Nursery was opened at New Dorp Beach, Staten Island, in 1881. It started with four mothers and eight children and during that season 103 were cared for. The work grew so rapidly that six years later it was thought wise to organize the Floating and Sea Side Hospitals with attendant medical and nursing staff. The St. John's Guild now exists as a corporation, established under the laws of New York: "For the relief of the sick children of the poor of the city of New York, without regard to creed, color or nationality."

Its two hospitals work conjointly. Sea Side opens in June, and until the Floating Hospital is put into commission patients are met at the Staten Island Ferry, New York, by nurses, who accompany them to New Dorp. During July and August, while the boat is in use, it serves not only to convey sick patients, but also offers daily trips to those not in need of constant medical

PATIENTS WAITING TO GO ABOARD

INSPECTION BY THE DOCTOR

attention. At present the Floating Hospital consists of a barge, the *Helen C. Juilliard,* 215 feet long and 40 feet beam. The lower deck contains the dining-room, where, at midday, dinner is served to the mothers and older children while the boat lies at anchor off New Dorp Beach.

On the main deck forward are the staff room and two wards, each containing nine beds. Aft of these is the bath-room, equipped with thirty-two spray baths for tempered salt-water and eight porcelain tubs. Children are required to take a bath upon admission.

WARD IN FLOATING HOSPITAL

The deck above is open for patients. All the benches provided for them are so constructed that they could be used for life rafts in case of accident.

On the hurricane deck forward is the pilot house and officers' quarters, while aft there is a small quarantine ward for emergency. This is rarely used, as the patients are inspected both by a representative of the Board of Health and by a staff doctor.

The barge is not equipped with power except for its pumps. Its capacity is limited to 1,600, and frequently during the hot summer days nearly double this number apply for admission.

Medical treatment on board is largely preparatory for that of Sea Side. The staff consists of a doctor and five nurses, who advise regarding feedings and care for any emergencies. During the trip, which generally lasts about five hours, milk is freely provided for all. The diet kitchen furnishes the following stock formulæ:—

BATH ROOM ON FLOATING HOSPITAL

FLOATING HOSPITAL, ST. JOHN'S GUILD, NEW YORK.

INFANT FEEDING FORMULÆ.

Formula No. 1. Of 16 ounce top milk take 6 ounces.
Boiled water, cooled, 26 ounces.
Milk sugar 4 even tablespoonfuls (1½ ounces).
Mix together thoroughly. Give 2 to 3 ounces every two hours during day and once or twice during night. Warm before feeding.

TRANSFERRING PATIENTS TO SEA SIDE HOSPITAL

ADMINISTRATION BUILDING, TWO ADJOINING PAVILIONS AND THE BATHING BEACH. OPENED SEASON OF 1913

Formula No. 2. Of 20 ounce top milk take 14 ounces.
Boiled water, cooled, 22 ounces.
Milk sugar 3½ even tablespoonfuls (1¼ ounces).
Mix together thoroughly. Give 2½ to 3½ ounces every two hours during day, and once or twice during night. Warm before feeding.

THE ADMINISTRATION BUILDING AND ONE PAVILION, FROM THE REAR. THE PLAYGROUND FOR CHILDREN

Formula No. 3. Of 20 ounce top milk take 14 ounces.
Thin barley water, cooled, 18 ounces.
Milk sugar 3½ even tablespoonfuls (1¼ ounces).
Mix together thoroughly. Give 3½ to 4½ ounces every three hours during day, and once at night. Warm before feeding.

Formula No. 4. Whole milk (mixed), 22 ounces.
Barley water (medium thick), 20 ounces.
Milk sugar 3½ even tablespoonfuls (1¼ ounces).
Mix together thoroughly. Give 5 to 7 ounces every four hours only during the day. Last feeding at 10 or 11 P.M. Warm before feeding.

Formula No. 5.	Whole mixed milk, 28 ounces. Barley water, thick, 14 ounces. Milk sugar 3½ even tablespoonfuls (1¼ ounces). Mix together thoroughly. Give 6 to 8 ounces every four hours only during the day. Last feeding at 10 or 11 P.M. Warm before feeding.

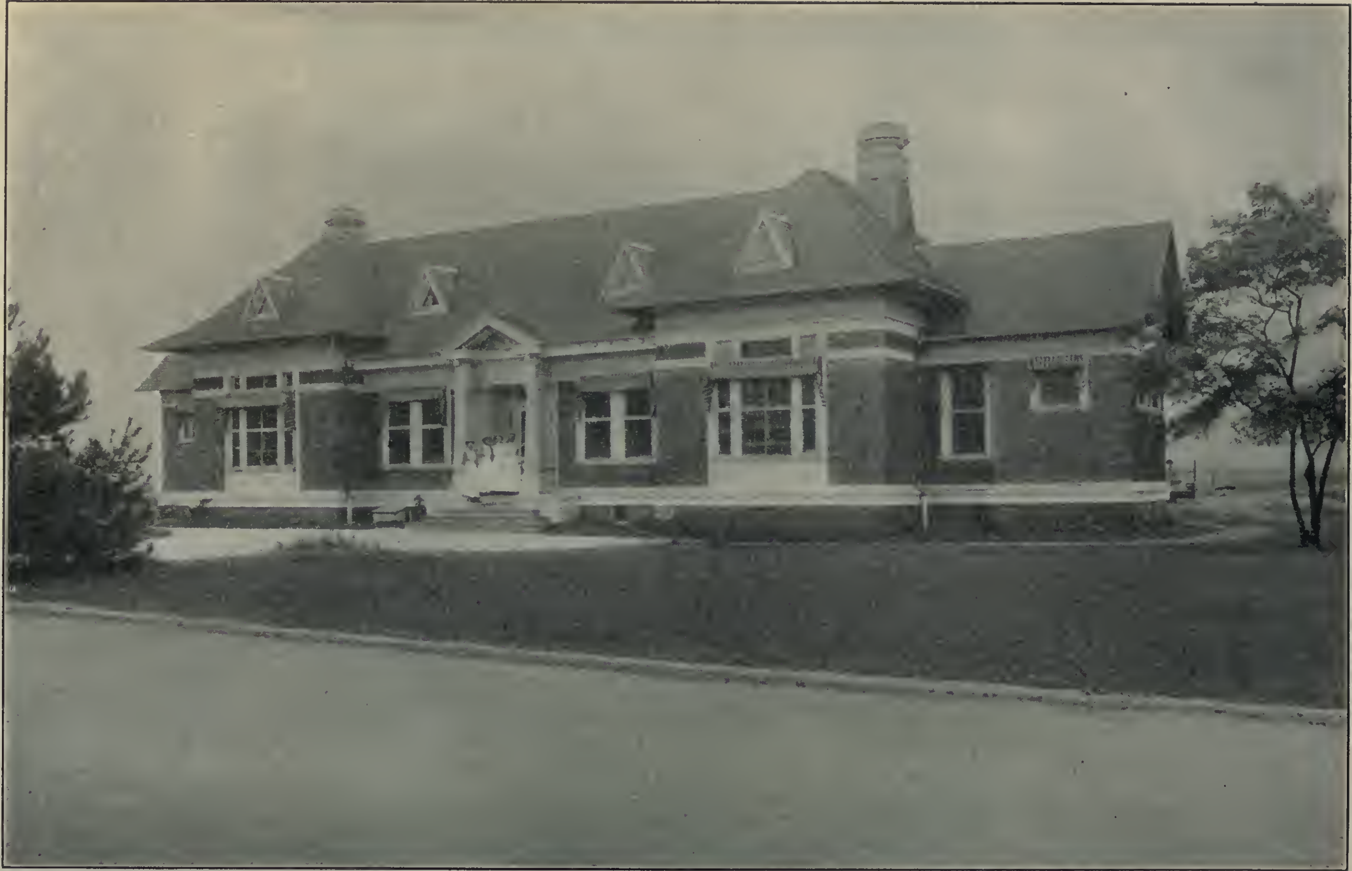
After this undiluted whole milk may be given or it may be best to dilute with one-quarter the quantity of oatmeal or barley jelly.

SICK WARD AT SEA SIDE

Keep the bottles on ice. Cork the bottles with clean absorbent cotton.

Admission cards to the Floating and to Sea Side Hospitals are sent for distribution to the various charity organizations, dispensaries and hospitals in the city.

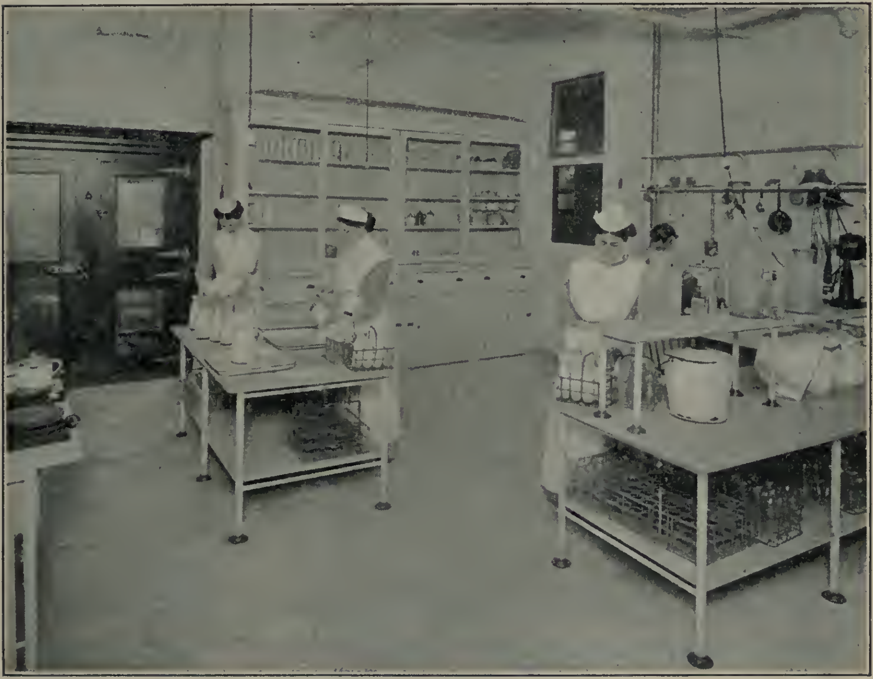
The Sea Side Hospital is peculiarly well adapted for its work.



LEWIS MEMORIAL

The plant now covers fifteen acres and includes twenty buildings, accommodating 350 patients.

The main, or administration, building has an eastern exposure and contains the executive offices, staff apartments, operating rooms, dining rooms and kitchen. Erected at angles to this are four pavilions, each divided into two wards containing ninety beds. There are twelve glass doors which open from the wards directly upon a porch extending the entire length of the pavilion. At the outer end of each of these is a large solarium. The new buildings are all of concrete and in every way fireproof.



DIET KITCHEN AT SEA SIDE

One of the older cottages, the Lewis Memorial, is also devoted to sick babies. It contains two wards of eight beds each, irrigating rooms and kitchen. Facing the bay is a large open porch, which is used constantly for the patients.

The medical staff consists of a house physician and two assistants, hospital graduates, who are appointed by the medical board. They examine every case before admission, make rounds

BATHING AND IRRIGATING ROOM AT SEA SIDE

ISOLATION BUILDING

in the sick and well wards at least twice a day and have general charge of the medical and laboratory work.

The nursing staff comprises forty graduate and undergraduate nurses, to whom lectures are given once or twice a week by the attending physicians.

All acute conditions except contagious diseases are admitted. Naturally the majority of cases treated during the summer are those due to some form of intestinal disorder. This past season 350 out of nearly 400 were of this nature.

The growth of these institutions is shown somewhat by the annual increase in the number of admissions.

	1910	1911	1912
Floating Hospital	45,947	47,658	55,611
Since its founding a total of 1,644,911.			
Sea Side Hospital	2,400	2,916	3,239
Since its founding a total of 55,947.			

This winter the Sea Side Hospital is to remain open for convalescent cases and for certain chronic conditions. These will include orthopedic, cardiac and postpartum cases as well as general diseases. The service will be absolutely free to women and children, who will be examined for admission upon application to the office of the Guild, 103 Park Avenue.

The Floating Hospital is also to be used during the winter for the first time. With the co-operation of the Board of Health and directly connected with the Willard Parker Hospital, it will be opened as a reception ward for patients suffering from whooping-cough and its complications.

The work of St. John's Guild must be seen to be fully appreciated. As its institutions are almost entirely supported by voluntary contributions, they are always open for inspection and visitors are cordially welcomed.

During the past as an organization it has accomplished much, and now with its increased capacity and with its modern equipment it anticipates a greater sphere of usefulness to the sick poor of New York.

50 Central Park West.

A STUDY OF THE CHILD IN THE TUBERCULOUS MILIEU.* †

BY MAURICE FISHBERG, M.D.,

Physician to the United Hebrew Charities; Attending Physician, Tuberculosis Pavilion, Montefiore Home and Hospital, New York.

The significance of the tuberculous milieu for the growing child has been investigated from various standpoints. The well-known autopsy findings of Naegeli, Beitzke, Burkhardt, Lubarsch, Wollstein, Hamburger, Ghon and others have shown conclusively that tuberculosis is more frequent among children than has formerly been appreciated by clinicians; and the modern methods of tuberculin diagnosis, especially the cutaneous reaction devised by von Pirquet, which is so easy to apply and altogether harmless, have shown that the proportion of living children infected with tuberculosis is appallingly high. The theories of Behring, Calmette, Hamburger, etc., to the effect that in the vast majority of cases tuberculous infection takes place in childhood, remains inactive or latent for years. to break out again in the adult, have greatly stimulated the study of this disease as it occurs in early life, and medical literature abounds in studies of tuberculosis in infancy and childhood.

The finding that at the age of fifteen 90 per cent. of humanity is infected with tuberculosis has been contested by many authors. It has been stated that autopsy findings record conditions of sick children dying from some disease, in many cases from tuberculosis in which the process may have been latent, yet it cannot be said with certainty that it did not contribute to the lethal outcome of the cases. Similarly the diagnosis of infection by the tubercle bacilli in a large proportion of children made with the various tuberculin tests were objected to because most of the reports available in literature refer to children who were sick, patients in hospitals and dispensaries. The cases reported by von Pirquet[1] consisted mainly of children who were admitted to hospitals on account of tuberculosis. Hamburger's[2] material consisted of cases admitted to the St. Anna Hospital for children at Vienna because of scarlet fever, measles, diphtheria, cerebrospinal meningitis, or non-tuberculous surgical affections. Holt[3] reported on ward cases of the Babies' Hospital in New York, and a large proportion were known to be actively tuberculous. McNeil[4] applied the tuberculin test to children in all the medical wards of the Hospital for Sick Children at Edinburgh, and Paget Lapage[5] "chiefly to children showing indefinite signs which may point to tuberculosis, and have been of the class that usually attends a hospital."

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* Read before the New York Academy of Medicine, December 18, 1913.

† The investigations upon which this paper is based have been made possible through funds supplied by the New York Foundation. Mr. Morris D. Waldman, Manager of the United Hebrew Charities in New York, has greatly assisted in our efforts to get the children for examinations, which was quite difficult in many cases. During the preliminary examination, Dr. Philip Katzen has rendered invaluable services.

It is thus seen that the objections raised against many of these investigations may be to some extent justified. Children sick with any disease may have been infected with tuberculosis to a greater extent than such as are manifestly healthy, just as among dead children the proportion who show tuberculous lesions at autopsy may be expected to be much higher than among those who survive the first fifteen years of life.

I am confident that the material here recorded meets in a great measure most of these objections. This investigation was made of all the children of tuberculous applicants for relief to the United Hebrew Charities in New York City during the three months, March, April and May, 1913, taken as they came, without any selection. After ascertaining that either the father or mother, or both of the parents, were tuberculous, we proceeded to investigate the social, economic and hygienic conditions of the family, and all the children under fifteen years of age were examined medically and the cutaneous tuberculin test applied. About four months later each child was re-examined, and those who reacted negatively to the first tuberculin test were again tested according to the von Pirquet method. The criteria which served for the diagnosis of active tuberculosis will be discussed in detail further on.

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[1] C. von Pirquet, "Frequency of Tuberculosis in Childhood," Journal of the American Medical Association, Vol. LIII., 1909, p. 675.

[2] F. Hamburger, Die Tuberkulose im Kindesalter, Second Edition, 1913, p. 73.

[3] L. E. Holt, "Report upon 1,000 Tuberculin Tests in Young Children," Transactions of the Sixth International Congress on Tuberculosis, Vol. II., p. 551.

[4] Ch. McNeil, "Tuberculosis in Infancy and Childhood," British Medical Journal, September 21, 1912, p. 677.

[5] C. Paget Lapage, "The Cutaneous Reaction to Tuberculin in Childhood," British Journal of Children's Diseases, Vol. IX., 1912, p. 493.

Social and Economic Conditions.—Altogether 217 families were investigated, of which 136 lived in the lower East Side, and 81 in the Bronx of New York City. From the data collected by the visiting nurses it was ascertained that these families consisted of 1,369 persons, of whom 1,129 lived at home and 792 were under fifteen years of age. Considering that they were all dependents, it cannot justly be said that the overcrowding of these people was more striking than is usual among dependent families in large industrial centers like New York City. Yet inasmuch as they each have had at least one tuberculous member, it must be agreed that everything connected with these households was favorable for the dissemination of the disease among the children. Thus, these 217 families lived in 717 rooms, averaging 3.3 rooms per household, or 1.57 persons per room, the size of which was in the vast majority of cases the minimum that can be found in New York tenements, and many of the sleeping rooms had no windows communicating directly with external atmosphere. Another way of showing the mode of life of these tuberculous families is by mentioning that there were only 658 beds, cribs, couches, etc., for 1,129 persons, *i.e.*, only 0.58 per person. In other words, roughly speaking, there were on the average two persons to sleep in each bed.

An inquiry was also made as to the number of consumptives who slept in separate rooms to themselves, and it was found that of 274 tuberculous persons only 112 had a separate room for each; it was also found that only 136 consumptives slept in beds to themselves, while the rest have one or more persons sharing the bed with them. Some consumptive mothers were found to "sleep with two children in one bed," "to sleep on chairs," "on the floor in the kitchen," etc.

The dependency of these people was of various grades. Some were wholly dependent for their livelihood on the relief given them by the United Hebrew Charities, others had only their rent paid by the society, while still others, though few, received only occasional material relief. It is to be understood that most of them could not afford the minimum luxuries of the workman out of a job. Schlossmann,[6] a keen observer, says: "When a consumptive lives in the household of a poor man, immaterial whether the sick person is the father or the mother, the probabilities that the young children will become infected are so great that the fact of their living with an 'open' tuberculous case is equivalent to a diagnosis." In the homes of persons who spent some time at institutions because of tuberculosis we are sure to find that the children who had lived with the patient are almost invariably tuberculous. On the other hand, he has made a long series of observations among tuberculous women of the well-to-do classes who were expectorating sputum containing tubercle bacilli, and who have spent some time in sanatoria, and yet the children were not infected, thanks to the good hygienic surroundings and the scrupulous cleanliness which they observe.

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[6] A. Schlossmann. Ueber Diagnostik und das Versagen der Diagnostik bei der Tuberkulose im frühen Kindesalter, Zeit. f. Tuberk., Vol. XXI., 1913, p. 166.

In this investigation we are dealing with a group of families in which the children are burdened with the most potent factors effective in the direction of spreading tuberculosis—*heredity and environment*. If the former is the most important factor in disseminating tuberculosis, we should find more of the disease among these children than among children of non-tuberculous parents; if the latter is the only mode of propagation of tuberculosis, we have here all the predisposing and exciting causes of this disease—poverty with its concomitants, congestion and overcrowding, lack of fresh air and sunshine, underfeeding, and an abundance of tuberculous sputum near at hand.

Feeding During Infancy.—Of the 692 children under fifteen years of age, 636, or 92 per cent. were exclusively breast-fed; 17, or 2.5 per cent., were brought up on a mixed diet, and 39, or 5.5 per cent., were artificially-fed. Compiling my figures I find that the children raised on artificial food showed no larger proportion of tuberculous infection (positive tuberculin) or morbidity than those who were exclusively breast-fed.

While among the general population breast feeding of infants is one of the best prophylactics against disease, because it gives to the child the natural, and especially the aseptic, food that it requires, with tuberculous mothers breast-feeding is not to be considered an unmixed blessing. It has lately been found that milk of tuberculous mothers contains tubercle bacilli. Kurashige[7] and his pupils found the bacilli in tuberculous women whose mammary glands were healthy, while milk of non-tuberculous women contained no bacilli. But these findings are to be taken with considerable reservation. He also found tubercle bacilli in the blood of 155 tuberculous patients in all stages of the disease, and in the blood of 20 out of 34 (59 per cent.) of apparently healthy adults. Needless to say that these findings have not been confirmed by others. Noeggerath[8] experimented with a view of ascertaining whether tubercle bacilli are present in the milk of consumptive women. Under aseptic precautions 20 to 50 c.c. of milk was obtained and injected subcutaneously and intraperitoneally into guinea pigs. The animals were killed four months later and a search made for tuberculous changes. The results were that of twenty-six women under observation, bacilli were found in the milk of only one patient with active tuberculosis, in two with latent tuberculosis, and in one suspected of having the disease. The tubercle bacilli were virulent in two instances and in two their virulence was attenuated. It is Noeggerath's opinion that Behring's contention that tubercle bacilli are secreted in the milk of tuberculous mothers is incorrect, because the number in which they are found is not large enough to be a source of danger to the child. However, some statistics apparently show that the longevity of infants fed at the breast of tuberculous mothers is rather unfavorable when compared with those who are fed artificially. Deutsch[9] found that the infants that were infected were invariably nursed by a tuberculous mother, while artificially-fed infants remained free from infection, although their mothers suffered from active or latent tuberculosis. Then it must also be borne in mind that nursing has a deleterious influence on the course of the disease in the mother.

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[7] T. Kurashige, R. Mayema and G. Yamada, Ausscheidung des Tuberkelbazillus aus der Milch tuberkulöser Frauen, Zeit. f. Tuberk., Vol. XVIII., 1912, p. 433.

Our experience with the infants of this series do not bear out these contentions in their entirety. The infants suckled by tuberculous mothers did not all succumb during their first three years, although in many cases I have noted a strong tendency to aggravate the disease in the tuberculous mother. Pollak's[16] experience in Vienna has been to the same effect.

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[8] C. T. Noeggerath, Das Stillverbot bei Tuberkulose und Tuberkulose Verdacht, Prakt. Ergebn. d. Geb. u. Gynek., Vol. IV., 1911, p. 1.

[9] Deutsch, Tuberkulose und Stillen, Münch. Med. Woch., Vol. LVII., 1910, p. 1,335.

Among the cases here reported there are many women who have been suffering from "open" tuberculosis for as long as three, five and even ten years, and have during that time given birth to children that remained clinically well, although every one of them reacts positive to tuberculin. On the whole, it seems that for the child, as long as it remains in the tuberculous milieu, it is immaterial whether it is breast-fed or artificially-fed. It is bound to become infected either way. Whether it will survive the infection depends on many factors, such as the quality of the milk secreted by the mother, the child's powers of resistance, intercurrent diseases, etc. To massive infection all infants that remain in intimate contact with a person with "open" tuberculosis are exposed. In cases in which the consumptive is a member of the family other than the mother, it is, in fact, much better for the child to be suckled, because in this manner the food is least exposed to contamination by tubercle bacilli.

Emaciation.—The general appearance of children is often important as an indication of their condition of health. Sick children look sick, as a rule, and mothers know instinctively that there is something wrong with the child when it does not present a healthy appearance. Children suffering from active tuberculosis, and many who are in the latent stages of this disease, are pale, emaciated or at least undersized, not so much in height as in bulk, and have a poor appetite, flabby muscles, etc. Indeed, when a child of poor general appearance coughs for some time, physicians are usually alarmed and think at once of tuberculosis.

Of the 692 children under fifteen years of age examined in this series, 169, or 24.3 per cent., were put down as of poor general appearance. Considering that this is determined in a rather superficial way, and is altogether subjective, it is advisable to measure the general condition of the children with some more objective method. This can be done, with some degree of exactness, by taking the average weight of the children. This was done in each case and we have a record of the weight at the first examination, as well as at the second examination, four or five months later.

On the whole, it was found that these children were short of weight when compared with children whose parents are not tuberculous, as can be seen from the following table:—

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[16] R. Pollak, Ueber Säuglings-tuberkulose, Brauer's Beitr. z. Klin. d. Tuberk., Vol. XIX., 1911, p. 373.

Age	Children of Tuberculous Parentage		Children of the General Population	
	Male	Female	In Russia	In New York
			Male	
0 to 6 months . . .	5.71	5.44		
6 " 12 " . . .	8.73	8.37		
2 years	10.36	10.57		
3 "	12.06	12.33		
4 "	14.50	13.25		
5 "	14.85	15.57	16.18	
6 "	18.40	17.64	19.17	
7 "	17.91	18.94	20.02	
8 "	21.73	21.42	22.14	25.4
9 "	22.68	24.57	24.45	26.0
10 "	26.14	25.20	25.69	27.9
11 "	29.16	28.44	27.29	30.8
12 "	31.18	31.51	30.75	33.1
13 "	34.24	30.64	33.34	37.1
14 "	35.33	31.45	37.89	42.3

In this table the weight of the children examined is compared with the children of the same ethnic stock measured by Dr. S. Weissenberg[10] in South Russia, and by Professor Franz Boas[11] in the New York Public Schools. It is to be regretted that we have no data as to the average weight of Jewish children under six years, because Weissenberg gives figures of children over five and Boas over seven years of age. But as it is we find noteworthy facts in this table. It appears that during the first two years of their life children in a tuberculous milieu were of fairly normal weight. They compare in this regard favorably with children of the general population, as can be seen when our figures are compared with tables of standard weights given in text-books on pediatrics. Several reasons may be given for this phenomenon. The descriptions of text-books that newborn infants of tuberculous mothers are pale, emaciated, and lack vitality are not based on fact, and exact investigations have shown that the opposite is often true. Sixty years ago Grisolle[12] showed that 25 per cent. of the infants of tuberculous mothers were quite healthy. More recent investigations have shown that the newborn infants of tuberculous parentage are, on the average, not below those of non-tuberculous descent. Townsend[13] found that in cases of incipient phthisis of the mother the infants arrived at full term and all were discharged from the Boston Lying-in Hospital at the end of two weeks. The average weight was 6 pounds and 11 ounces. Of the moderately and far advanced cases many infants were also of normal weight. He concludes that the average weight of full-term infants and their general condition at birth is not markedly below that of children of healthy mothers except in rare instances of congenital tuberculosis. Judging from appearances of the infants of tuberculous parentage that I have met, I am convinced that at birth they are no different than those of non-tuberculous stock. In this group of infants we found them, with but few exceptions, of excellent general appearance and they thrived because they were almost invariably breast-fed and did not share the social misery of their parents as regards food. Considering that only a small proportion is infected at this tender age, their general health may not be impaired while they are at the breast. It must, however, be mentioned that infants may suffer from latent tuberculosis, or even from active disease, and may show no signs of emaciation for a long time, and I can confirm Pollak's observation that infantile tuberculosis leading to cachexia is quite rare. Indeed, we often see cases of tuberculous meningitis attacking well-nourished infants. But after the fifth year the difference between these children and those of healthy parentage is striking. They lack between 2 and 4 pounds in weight when compared with children of school age in Russia; and when compared with Jewish children in New York City the difference is appalling. The difference in favor of the latter class is 3.67 kilograms at the age of eight, and even 6.97 kilograms at the age of fourteen.

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[10] S. Weissenberg, Die südrussischen Juden, Archiv. f. Anthropol., Vol. XXIV., 1895.

[11] F. Boas, "Changes in Bodily Form of Descendants of Immigrants," Washington, 1911.

To be sure, a great part of this lack of weight may be attributed to their poverty, with its concomitant lack of food. But then tuberculosis is a disease of social misery, and it is difficult to say which is the cause and which the effect. Among most of these tuberculous families it was found that the disease was the cause of their dependency, because many were self-supporting till disease made its appearance in the breadwinner of the family.

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[12] A. Grisolle, De l'influence que la grossesse et la phthisie pulmonaire exercent reciproquement l'une sur l'autre, Archiv. Gén. de Méd., Vol. XXII., 1850, p. 41.

[13] C. W. Townsend, "Phthisis and Childbearing," Boston Medical and Surgical Journal., Vol. CXXXVII., 1897, p. 391.

Healthy children gain in weight constantly. While in normal adults a lack in this direction is not necessarily an indication of disease, because they may have reached their normal standard, or even exceed it, with children conditions are different. Commensurate with their gain in height there must be a gain in weight in children of school age. It is known as the normal increment in the size of the body. When a child does not gain in weight it is, with few exceptions, an indication of disease. During the eighteen weeks, the average time that elapsed between taking the first and final weight of these children, one-half had not gained; 10 per cent. had actually lost, and 40 per cent. had gained. Considering the double handicap under which these children have been laboring—the hereditary transmission of physical debility manifesting itself in their predisposition to diseases, among which tuberculosis is but one, and the poverty and social misery of their parents—it is understood that they could not but be under weight.

The Habitus Phthisicus.—Just as in the case of adults, many authors consider the paralytic chest an important sign of tuberculosis in the child. Among the signs of the so-called "prétuberculose," or "tuberculose préphthisique" of French writers, the flat chest is mentioned first. But this form of chest is found among children with flabby muscles and in whom there is no symptom or sign of tuberculosis, and I have met it even in those in whom the tuberculin test was negative. Of the 692 children examined, 433, or 62.5 per cent., had chests of normal form and shape. It must be mentioned in this connection that rickets is not excessively frequent among these people, by far less prevalent than among other immigrants in our large industrial cities, like the Hungarians, Italians or Poles. This is perhaps the reason why, notwithstanding the social misery and poverty of these people, only 69, or 10 per cent. of the children, had chests which could be called rachitic, and 190, or 27.5 per cent., had flat chests.

The proportion of flat chests is rather high, and not to be encountered among other classes of children. But we must bear in mind that the flat chest is a characteristic of the ethnic stock from which they descend, and some anthropologists believe that it is a "racial trait" of the Jews.[14] I am under the impression that among the Jewish children of non-tuberculous parentage in the East Side of New York the proportion is not materially lower. My anthropometrical investigations[15] among adults confirms this view, and the experience of medical directors of high schools and colleges in the United States shows the same conditions among adolescent Jews. That this form of chest is, however, not an inherent racial trait, of phylogenetic origin, is shown by the fact that among infants under three years it is exceedingly rare. In only one infant under one year do I find a record of a flat chest in this series, and this child showed other stigmata of tuberculosis, which is in agreement with Pollak's[16] observations to the effect that the *habitus phthisicus* in children is a result of tuberculous infection and not a cause of it. All our observations tend to show that the flat, long chest has nothing to do with tuberculosis. Most of our cases of tuberculosis were found having chests of good construction, and Striker and Vogt's[17] observations are to the same effect.

Enlarged thoracic veins, which some consider a sign of tracheo-bronchial adenopathy, were observed in 65, or 8 per cent. of the children. This is also rare among infants under two years of age. The veins are usually visible in the upper part of the thorax; mostly bilateral, though not symmetrical, and at times unilateral. Of the children in whom a diagnosis of active tuberculosis was made, 37.5 per cent had enlarged and visible thoracic veins, and of these three-fourths were unilateral. Of the children in whom the diagnosis of latent tuberculosis was justified, or in whom it was strongly suspected, 25 per cent. had enlarged thoracic veins, while among the manifestly healthy children only about 1 per cent. showed this sign.

It thus appears that this is a fair sign of compression of the main trunks of the intrathoracic veins by enlarged glands or adherent pleura. My general experience, however, urges me to warn against hasty diagnosis based on this sign alone. It is

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14. See M. Fishberg, "The Jews: A Study of Race and Environment," London, 1911, p. 88.

15. M. Fishberg, "Materials for the Physical Anthropology of the Eastern European Jews," Memoirs of the American Anthropological Assn., Vol. I., Washington, 1905.

16. R. Pollak, Ueber Säuglings-tuberkulose, Brauer's Beitr. z. Klin. d. Tuberk., Vol. XIX., 1911, p. 373.

17. N. Striker and H. Vogt, Die Diagnose d. Lungentuberkulose im Kindesalter, Fort. d. Deutsch. Klin., Berlin, 1913, Vol. III., p. 293.

met with in many healthy persons, especially such as have delicate and transparent skin, and also in many anemic individuals, particularly women during lactation, when it may be unilateral. It is also encountered in many persons suffering from non-tuberculous affections of the bronchi, lungs and pleura, especially chronic bronchitis, asthma and pulmonary emphysema.

Enlarged Superficial Glands.—If we should take enlarged cervical glands as a criterion of tuberculosis, we would find very few children who live in poverty and under adverse hygienic surroundings who are free from this disease. Among the 692 children here reported, 469, or 67.8 per cent., had swollen cervical glands. In other regions, like the axilla, groin, etc., enlarged glands were very rare; only 8 cases of the former and 2 of the latter are mentioned in our records.

That these glands are not necessarily tuberculous, nor always an indication of intrathoracic tuberculosis, need not be emphasized. They are usually due to carious teeth, hypertrophied tonsils, stomatitis, eczema or pediculi of the scalp, etc. In fact, anatomically the cervical glands have no direct connection with the tracheo-bronchial nodes, and there is no etiological relation between them and tuberculosis. I concur with Hamburger, who says that swollen cervical glands are too often diagnosed as tuberculous, while general tuberculosis is less often recognized than facts would warrant. Of course, when tumors on the neck are very large and persistent, showing little tendency to caseation or suppuration, they are almost invariably tuberculous. But not a single case of this kind has been met with among these children while they were under observation.

Of great importance in the diagnosis of tuberculosis is enlargement of the supraclavicular glands, especially when it is found unilaterally. This speaks for tuberculosis of the costal pleura, as has been pointed out by Hamburger. In adults it is not at all rare and often interferes with apical percussion, but in children it is rather unusual. Only one has been found with swollen supraclavicular glands among these 692 children, and this child had other symptoms and signs of tuberculosis.

Enlarged Tonsils and Adenoids.—The number of children with enlarged tonsils and with adenoids was rather large. Among the 692 examined, 406, or 58.6 per cent., had either enlarged tonsils, or adenoid vegetations in the posterior nares, or chronic rhinitis, or all these conditions. Chronic rhinitis was quite common among the infants under three, while hypertrophied tonsils and adenoids were more common among those between three and ten years of age. I am under the impression that an examination of a large number of children of non-tuberculous parentage and of the same social status as those here reported will show the same proportion of hyperplastic and catarrhal conditions of the nose and throat.

The relations of these conditions to tuberculosis have been debated for many years. In many children we find that the adenoids and enlarged tonsils are accompanied by chronic otitis media, blepharitis, lymphatic conjunctivitis or keratitis combined with various skin eruptions, and thus we get the traditional picture of scrofula which, since Laennec, has been considered by many as tuberculosis *per se*. Even Soltmann's theory to the effect that scrofula is not directly caused by the tubercle bacilli, but by the tuberculous toxins which permeate through the placenta and thus poison the fetus, creating a vulnerability or diathesis, does not alter matters. It only makes scrofula a sign of tuberculosis. Cornet,[18] on the other hand, believes in a dual origin of scrofula. He finds two distinct exogenic causes for this condition—the tubercle bacillus and also pyogenic bacteria—to which is absolutely necessary an endogenic component—a diathesis—in order to bring about scrofula. In recent years Escherich,[19] Czerny[20] and others have grouped all these conditions under one heading—the lymphatic, or exudative diathesis, which renders the child vulnerable to infection by tubercle bacilli. Lymphatism is said to prepare the soil upon which the tubercle bacilli thrive and produce scrofula. Koplik[21] summarizes these theories thus: "With recent advances in our methods of diagnosis we are fast beginning to recognize that in the term scrofulosis there is a distinct clinical tuberculous entity."

These authors base their opinion of the tuberculous nature of scrofula on the observation made that children with the scrofulous diathesis usually react very strongly to tuberculin, even in the most minimal doses. Whether this exaggerated reactivity to tuberculin, or "Hyperergy," as von Pirquet calls it, is an indication of a greater quantity of antibodies in the scrofulous, thus giving the child effective protection against the ravages of tuberculosis, or merely an alteration in the condition of the skin, cannot be said with certainty. Cornet has shown that the skin, mucous membranes and lymph passages of the scrofulous are very permeable to bacteria, and this may be the cause of the exaggerated cutaneous reaction to tuberculin of the scrofulous.

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[18] G. Cornet, Die Skrofulose, Vienna, 1912.

[19] T. Escherich, Was Nennen wir Skrofulose? Wien. Klin. Woch., Vol. XXII., 1909, p. 224.

[20] Czerny, Die exudative Diathese, Jahrb. f. Kinderh., Vol. LXI., 1905, p. 199.

[21] H. Koplik, "Tuberculosis in Infancy and Childhood," Johns Hopkins Hospital Bulletin, Vol. XXIII., 1912, p. 113.

Changes in the skin, especially in the cutaneous circulation, modify its power of reaction—this is the case when a mustard plaster is applied and various skin diseases to be mentioned later on—and the "anergy" or negative outcome of the cutaneous reaction in eruptive fevers, like measles and scarlet fever, etc., has been attributed by some to local skin condition, and not to general chemicobiologic changes in the body, although Hamburger attributes it to the general law that during the course of one infectious disease the power of reaction against another infectious disease is greatly reduced, and thus the clinical course of other diseases is influenced.

There are good reasons against the opinion held by many that there is strong relation between enlarged tonsils, adenoids, chronic nasal catarrh, etc., and tuberculosis. While we cannot enter into details here of this interesting subject, we shall merely refer the reader to an exhaustive paper by Simon,[22] in which he concludes that clinical experience, animal experimentation and histological research of tonsils and adenoids have shown that these rhinopharyngeal hyperplasias have nothing in common with scrofula and tuberculosis, and that as a point of entry into the body for the tubercle bacillus, the pharyngeal tonsils play only a subordinate rôle. The only thing in common between tuberculosis and exudative throat conditions in childhood that I can discover is that both are very frequently met with. But there is no proof that the tuberculous environment, or heredity is responsible for the conditions in the throat, nor that the later predisposes to tuberculous infection.

It is important to mention in this connection that scrofula was only rarely met with among the children under consideration in this paper, which would tend to confirm the opinion that tuberculosis is not etiologically related with the former syndrome.

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[22] G. Simon, Die adenoiden Wucherungen des Nasen-Rachenraumes in ihren Beziehungen zur Tuberkulose, Beiträge zur Klin. der Tuberk., Vol. XIX., 1911, p. 417.

Among the 692 children only 29, or 4.2 per cent., had scars on the neck due to operation for enlarged or suppurating glands, or their spontaneous discharge. Most of the external stigmata of tuberculosis in childhood, such as tuberculides, lichen scrofulosorum, erythema nodosum, phlyctenula, blepharitis, chronic conjunctivitis, etc., which European pediatrists, especially Hamburger,[2] describe, were exceedingly rare among the children here considered. Two infants were found with nearly all these stigmata, excepting erythema nodosum, but they were otherwise under-nourished and cachectic. Among the older children, between three and ten years of age, only 3 were found having an eruption simulating erythema nodosum; 6 had blepharitis, and 1 keratitis, but, on the other hand, trachoma was found in 41 of the 692 children, and trachoma has not yet been included among the signs of tuberculosis.

Although many authors maintain that these skin eruptions, as well as the phlyctenula, are essentially of a tuberculous nature—some have even isolated tubercle bacilli from them—yet it must be acknowledged that they are mostly found in children who live under adverse economic, hygienic and sanitary surroundings. It seems to me that they owe their origin more to filthy habits and surroundings than to tuberculosis. Even Hamburger,[2] who champions their tuberculous nature more than any other authoritative writer, says that it is a problem whether phlyctenula, conjunctivitis and certain skin eruptions are always tuberculous, but he adds: "I would answer that all phlyctenula are of tuberculous origin, but there is no proof of this contention." He bases his assertion solely on the fact that all the children between one and two years of age who have phlyctenulæ give a positive cutaneous tuberculin reaction. And among clinically tuberculous they are quite rare. Thus, Pollak[16] found them in only 6 out of 92 tuberculous infants. But I have met with children with phlyctenula, etc., reacting negative to tuberculin. I am rather inclined to agree with Stricker and Vogt,[23] who thus sum up the question: "It seems that the desultory appearance and disappearance of the phlyctenulæ, as well as the almost specific influence exerted on them by a dose of calomel, speaks against their tuberculous nature. If in some cases a tubercle bacillus has been found in a phlyctenula, it is naturally no proof that all phlyctenula are caused by these bacilli—there may have been a secondary implantation of the bacilli." The fact that Hamburger and other European observers find these tuberculides so often in children does not speak against this view. In the United States poverty is not as acute as it is in the large cities of Europe; and, many statements to the contrary notwithstanding, the overcrowding in our New York tenements is not as bad as in Europe, even in the slums of our large cities. Koplik[21] justly says in this connection that he does not believe from his studies "that our poor are as badly nourished or so severely crowded as those in Vienna." Although the families here investigated were all more or less of the dependent class, yet they lived under much better surroundings than many self-supporting workmen in Vienna, Paris, Naples, etc. This is probably one of the reasons why the scrofulides, tuberculides and phlyctenulæ are so rare among them, although the proportion of infected children is as great as among those investigated by Hamburger. Another reason for the large number of cases with these cutaneous stigmata of tuberculosis in Vienna is that Hamburger reports about children sick and admitted to hospitals for this reason, and it is well known that the phlyctenulæ and the tuberculides are mostly seen in the terminal stages of this disease. The children here spoken of were not sick, as a rule, and those who showed signs of active tuberculosis were only in the early stages of the disease.

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[23] N. Stricker and H. Vogt, Die Diagnose der Lungentuberkulose im Kindesalter, Fort. der Deutsch. Klin., Vol. III., p. 311.

Frequency of Tuberculous Infection.—The cutaneous tuberculin test was applied to all the 692 children under consideration. Only concentrated, or crude, tuberculin was used and the well-known method devised by von Pirquet was relied on. In cases in which the first application gave a negative result, a second application was made. In some children who showed marked symptoms of tuberculosis, but in whom the tuberculin reaction was negative, a third inoculation was resorted to. In these cases it was often observed that the "secondary reaction" was very intense, although the first was negative. In others it was noted that the sensitiveness to tuberculin was increased by a second or third inoculation and that the spot at which the first inoculation was made also reacted, a phenomenon already observed and described by von Pirquet, Hamburger and others.

	MALE		FEMALE		TOTAL	
Age	Positive	Negative	Positive	Negative	Number	Per cent. Reacting Positive
1 to 6 months ..	1	5	—	8	14	7.14
6 " 12 " ..	3	10	1	5	19	21.05
1 year	1	5	4	6	16	31.25
2 years	13	8	9	3	33	66.66
3 "	18	7	13	6	44	70.45
4 "	19	6	12	9	46	67.39
5 "	20	8	15	10	53	66.04
6 "	17	6	10	9	42	64.29
7 "	23	10	20	8	61	70.49
8 "	18	7	19	6	50	74.00
9 "	20	9	20	7	56	71.43
10 "	28	12	26	11	77	70.13
11 "	12	4	18	5	39	76.92
12 "	12	5	23	10	50	70.00
13 "	18	9	21	7	55	70.91
14 "	20	3	11	3	37	83.79
Total	243	114	222	113	692	67.23

From this table we find that of 692 children 465, or 67.25 per cent., gave positive reactions. Of the 14 infants under six months of age only 1 reacted, and it is noteworthy that it was five weeks of age and its mother suffered from advanced pulmonary tuberculosis. The infants between six and twelve months of age have 21.05 per cent., with positive reactions, while of those between one and two years of age 31.2 per cent. reacted positive. At two years of age two-thirds of the children give positive von Pirquet reactions, and at fourteen the maximum is apparently attained—83.79 per cent. No sexual differences are to be noted. Of the 357 boys, 243, or 68 per cent., reacted, and of the 335 girls, 222, or 66.3 per cent., reacted. The proportion of positive reactions was about the same in each group.

Dividing our material in age periods, because of the small number in each group when each year is counted singly, does not give a smooth curve; we find the following conditions:—

Age.	Number of Cases.	Percentage Giving Positive Reactions.
0 to 1 year	33	15.15
1 " 2 years	49	55.10
3 " 4 "	90	68.88
5 " 6 "	95	65.26
7 " 10 "	244	71.31
11 " 14 "	181	74.58
14 "	37	83.79
Total	692	67.23

From this table it is seen that there is a steady increase in the proportion of children that react positive to the tuberculin test. From 15 per cent. during the first year of life the proportion jumps up to 55 per cent. at two years, and the increase is steady till it reaches 74.5 per cent. during the eleventh to the fourteenth year; and it reaches even 83.79 per cent. if we count the 37 children at fourteen years of age alone.

Before attempting to compare our results with those obtained by other investigators, it is necessary to point out that, strictly speaking, it is not feasible to make such comparisons. While the material here reported consists of all the children of tuberculous families and none of them have been inmates of hospitals or sanatoria at the time they were investigated, such is not the case with most of the cases reported in the literature of the subject. As was already mentioned, most of the other reports dealing with large numbers of children deal with cases in hospitals and dispensaries. Then, in nearly all the other reports we are not informed whether the parents were tuberculous or not. Another difficulty is that some use the cutaneous test, but once, and report the percentage that react positive, while here the test was applied twice and in many cases even thrice. The same is true of the strength of the tuberculin used. While here pure old tuberculin was used in full strength, others use only a dilution of 50 and even 25 per cent. Hamburger and others used the intradermal reaction or the *Stichreaktion*, while here von Pirquet's method was exclusively relied on.

Investigations of children living in a tuberculous milieu have shown that in Europe they are infected even to a much higher degree. Thus, Pollak[24] found that among infants under two years of age the proportion giving positive von Pirquet reactions was 96 per cent. But his material consisted mostly of sick infants brought to the clinic for treatment. From Cohn's[25] investigations it appears that in Germany the proportion of infected children is higher than in New York, as can be seen from the following figures relating to 273 children living in a tuberculous milieu:—

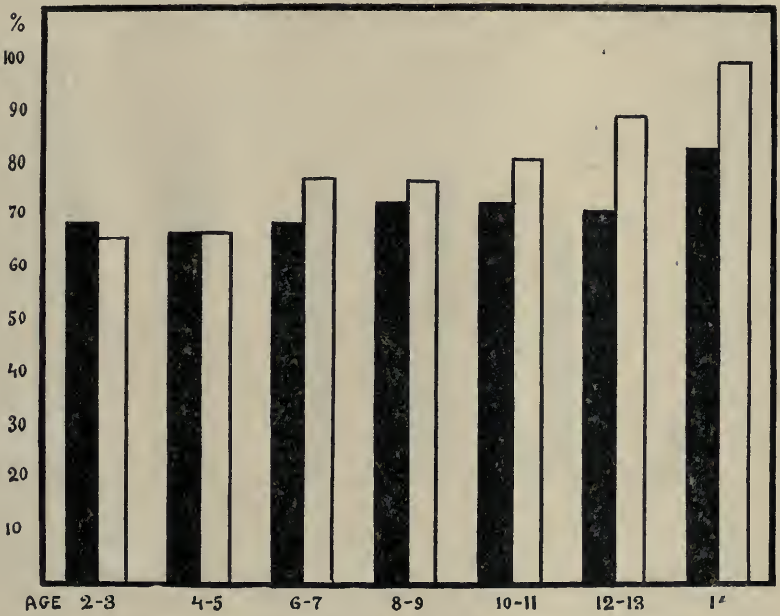

FIG. 1—Percentage of children living in a tuberculous milieu reacting positively to the cutaneous tuberculin test. Black—692 children in New York; white—273 children in Germany.

2 to 3 years	....	66.0 per cent. reacted
4 " 5 "	....	66.0 " " "
6 " 7 "	....	77.5 " " "
8 " 9 "	....	77.0 " " "
10 " 11 "	....	80.5 " " "
12 " 13 "	....	89.9 " " "
14 "	....	100.0 " " "

From these figures and from Diagram I. it is seen that up to the age of ten the proportion is about the same as among the children in New York, while after that age the number infected is much higher in Germany, reaching 100 per cent. at fourteen.

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[24] R. Pollak, Das Kind im Tuberkulösen Milieu, Beitr. z. Klin. der Tuberk., Vol. XIX., 1911, p. 469.

[25] L. Cohn, Die Bedeutung der v. Pirquetschen Hautreaktion im Kindesalter, Berl. Klin. Woch., Vol. XLVII., 1910, p. 1,817.

A comparison with Hamburger's[2] investigations shows some interesting points. He tested 532 children at the Children's Hospital in Vienna and found the following percentages of infections:—

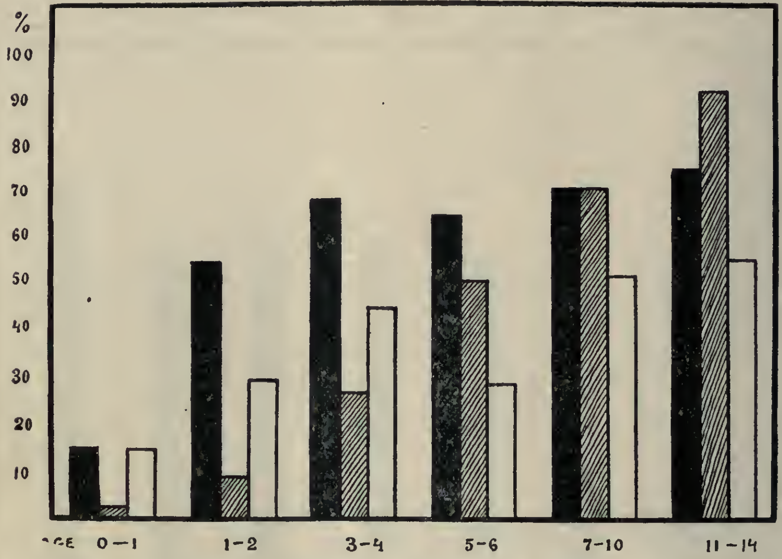

Fig. 2—Percentage of positive tuberculin reactions in 692 children in New York (black); 532 children in Vienna (shaded), Hamburger; 371 children in Edinburgh (white), McNeil. Note that the children in New York, taken from a tuberculous milieu, are infected earlier than the others who were taken from the general population applying for treatment at dispensaries and hospitals.

Age.	Number of Cases.	Percentage of Positive Reactions.
0 to 1 year	23	1
1 " 2 years	46	9
3 " 4 "	131	27
5 " 6 "	113	51
7 " 10 "	137	71
10 " 14 "	82	94

We see from these figures and from Diagram II. that the children in New York considered in this paper are infected much earlier than those examined by Hamburger in Vienna, which shows distinctly the effects of the tuberculous milieu. At eleven to fourteen years the proportion of infected children is higher in Vienna, which may be due to the fact that Hamburger used a more delicate test, the *Stichreaktion.* But von Pirquet's figures of 988 children in Vienna showed that with the same test as was applied to the children reported here the percentage of positive reactions was 90 at the age of fourteen.

Comparing our results with children who have not lived in such an acute tuberculous milieu, we find that during the first five years of their existence children greatly exposed to superinfection are infected in larger number, while after that age the difference is insignificant. Thus Calmette[26] tested with the cutaneous reaction 1,226 subjects of all ages, at Lille, France, taken at random from diverse social classes, all apparently healthy, *i.e.,* who do not frequent hospitals and dispensaries. His findings are given in the following table:—

Age.	Number of Cases.	Percentage of Positive Reactions.
0 to 1 year	273	8.7
1 " 2 years	145	22.1
2 " 5 "	206	53.8
5 " 15 "	366	81.4
15 and over	236	87.7

Here again we find (Diagram III.) that the children in New York, considered in this paper, living in a tuberculous milieu are infected earlier than the children at Lille. On the other hand, McNeil[4] found that of children taken at random from all the medical wards at the hospital in Edinburgh, the infants are already infected during the first year to the extent of 15 per cent., while, on the whole, the proportion infected is somewhat less than among the children in the tuberculous milieu. (Fig. 2.)

Age.	Number of Cases.	Percentage of Positive Reactions.
Under 1 year	64	14.1
1 to 2 years	61	29.9
3 " 4 "	75	46.6
5 " 6 "	52	28.8
7 " 10 "	79	51.9
12 " 14 "	40	55.5
Total	371	37.7

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26. A. Calmette, V. Grysez et R. Letulle, Fréquence relative de l'inféction bacillaire et de la tuberculose aux différents ages de la vie, Presse Méd., Vol. XIX., 1911, p. 651.

At Manchester Paget Lapage[5] tested 1,000 children and found a somewhat higher proportion of positive reactions than at Edinburgh, yet less than among the children in New York and in Vienna, as can be seen from the following figures:—

Age.	Number of Cases.	Percentage of Positive Reactions.
Under 2 years	103	32.0
2 to 5 "	209	51.2
5 " 10 "	446	60.6
10 " 14 "	242	50.8
Total	1,000	55.7

Although the percentage is higher than in Edinburgh probably because most of these children were suspected of suffering from tuberculosis, yet it must be borne in mind that Paget Lapage used only a 25 per cent. dilution of tuberculin, and, like McNeil, only applied the test once. Had these two groups of

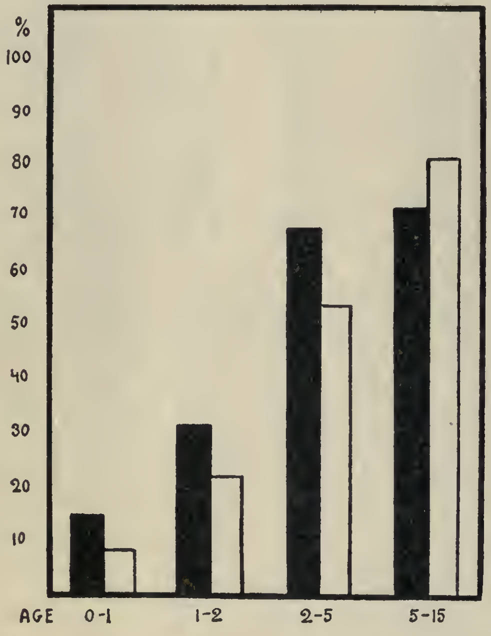

FIG. 3—Percentage of positive tuberculin reactions in 692 children in a tuberculous milieu in New York (black), and 990 children tested, by Calmette, at Lille, France (white), taken from all classes of population.

children been tested a second time in all cases that reacted negative to the first tuberculin application, the percentage of positive reactions would have been materially increased, as was the case with our material.

The effects of the tuberculous milieu on the child is most vividly seen when a comparison is made between the reactions to tuberculin obtained among children like those reported on in this paper and such as were born and brought up in well-to-do homes or in rural communities, where but few, if any, consumptives are met with. Very few such investigations have been made. In a recent investigation by Overland[27] it was found that school children of well-to-do parentage have fewer with positive reactions than those of the poorer classes, and also that in families with tuberculous persons the number of children reacting to tuberculin is four times as large as among those who have no consumptives in their midst. He found among 843 city children, 51 per cent. reacted at the age of fourteen, while 276 children raised in a village gave only 27.18 per cent. of positive reactions. Eighty per cent. of the children that reacted positive came from tuberculous homes. In another village he tested 284 children between six and seventeen years of age and found that 26.06 per cent. gave positive reactions, and of these 70 per cent. came from tuberculous homes. The effects of the tuberculous milieu are here shown quite vividly. Schlossmann[42] states that hardly 5 per cent. of the children of his rich clientele react to tuberculin, while of the poor at his hospital and dispensary the vast majority show the specific sign of infection. In an investigation of children in small rural communities in Germany, Jakob[28] found that of 2,744 tested with the von Pirquet method, only 35.6 per cent. reacted among those under six years of age, while among those between six and fourteen 45.9 per cent. reacted. He found that in houses in which there were cases of "open" tuberculosis, practically all the children reacted to tuberculin, while in houses in which there were no cases of active tuberculosis, hardly any reacted to tuberculin. Hillenberg[29] investigated several rural districts in Germany in which there had not been any cases of "open" tuberculosis for many years. The majority of the population is pursuing agriculture, the housing conditions good, the people economically prosperous and of cleanly habits. Of 810 children between six and fourteen years of age tested with tuberculin, only 25.9 per cent. reacted. The difference in the incidence of tuberculous infection among these children as compared with those we investigated in a tuberculous milieu in New York City is vividly shown on the accompanying diagram (Fig. 4), and is an excellent object lesson in prophylaxis of tuberculosis, which points the way of avoiding conditions as found among the inhabitants of the tenements in this city. Needless to say that massive infection was practically unknown in the rural communities just mentioned, and deaths from tuberculous meningitis have not been recorded for years.

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[27] B. Overland, Untersuchungen mit von Pirquet's Reaktion, Zeit. f. Tuberk., Vol. XX., 1913, p. 252.

[28] P. Jakob, Die Tuberkulose und die hygienischen misstände auf dem Lande, Berlin, 1911.

[29] Hillenberg, Weitere Beiträge zur Entstehung und Verbreitung der Tuberkulose, Tuberkulosis, Vol. X., 1911, p. 254.

[42] Pfandler and Schlossmann, "Diseases of Children," Second American Edition, Vol. II., p. 632.

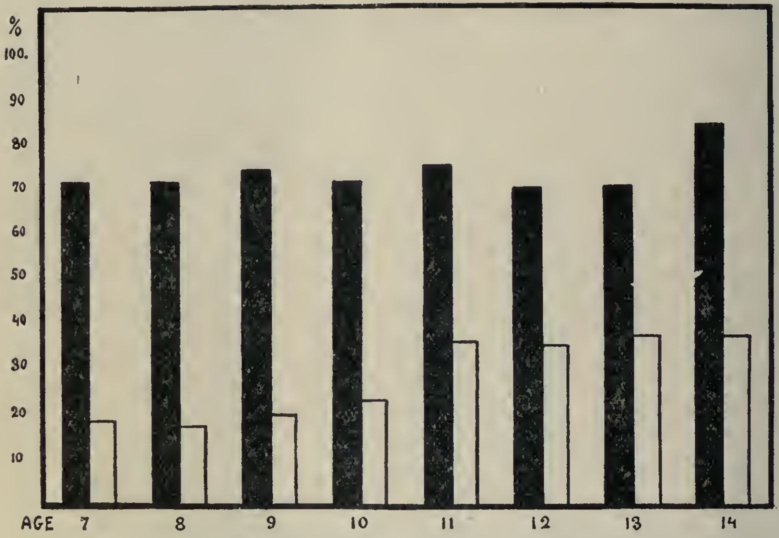

FIG. 4—Percentage of children giving positive tuberculin reactions among 692 living in a tuberculous milieu in New York (black), and 810 tested by Hillenberg and living in rural districts in Germany.

Active Tuberculosis.—In the diagnosis of active tuberculosis among the children here reported, I relied mainly on clinical evidence. The history, symptomatology and course of the disease was taken into consideration in each ailing child. In infants under two years of age physical exploration of the chest is of little value, and in some cases of tracheo-bronchial adenitis the same is true. It is well known that some children may be riddled with tubercles and suffer but little impairment of health. In fact, most physicians in active practice have met with cases in which the history and course of the disease pointed to anything but tuberculosis, yet in time it turned out to be the latter. But such cases are comparatively infrequent and as a source of error in diagnosis among 692 children may be left out of consideration. Most children suffering from active tuberculosis do show some symptoms and signs of the disease and physical exploration reveals in the vast majority of children over three years of age signs of the affection in the chest; and over six years of age the signs in the chest are nearly the same as in the adult, excepting that we more often find the lesion localized at the lower lobe of one lung. Another characteristic of tuberculosis in children is that the tracheo-bronchial glands are almost invariably involved in every case, and in a large number this is the only site of disease. But considering the extraordinary complexity of the symptomatology of tuberculosis in children, especially in infants, it is evident that in the individual case difficulties are often met with—sometimes unsurmountable difficulties.

From the statistical viewpoint, when a large number of cases are discussed, there are some points which we must bear in mind. Many of the tuberculous manifestations of infancy and childhood are easily discerned. The osseous, articular, glandular and meningeal cases are usually self-evident and in an investigation of the kind made among these children can hardly be overlooked. On the other hand, there are limitations to the class of cases that I am able to report among this group of children. Acute cases of tuberculous bronchopneumonia, meningitis, etc., were not brought to our clinic, although we took note of every case of death in the family and thus, to a certain extent, have information as to the mortality of children in these families and the causes of death.

At the conclusion of the investigation we found that children with osseous, articular and glandular tuberculosis were not excessive in number among these families. Inasmuch as these clinical forms of tuberculosis are usually very easy of discernment, and can hardly be overlooked, it is rather surprising that only 13 children had tubercular disease of the joints, 4 Pott's disease of the spine, and one tuberculosis of the cervical and axillary glands. Spina ventosa was found in only 2 children, 1 case being very mild, and improved greatly within the six months we had it under observation.

It can be said that these numbers are quite low for children born and reared in a tuberculous milieu. Among children of the same class in Europe, the proportion found with osseous, articular and glandular tuberculosis is much higher. I am inclined to attribute this difference between the European and New York children to the superior economic conditions in this country. Although all the parents of these children were partially or wholly dependent on children for subsistence, yet the society that cared for them took pains that they do not starve to that pitiable degree as can be seen among the proletariat in Europe, and the result may have been that hematogenous tuberculosis was thereby reduced to a minimum.

Of the 692 children under observation, 65 showed symptoms and signs of active tuberculosis. Of these, 21 had tuberculosis of the bones or joints, and glands, as was just stated; 19 showed distinct signs of pulmonary tuberculosis, and 25 of tracheo-bronchial adenopathy. All of the latter were reëxamined eight months after the first examination, and some that were classed before as tuberculous were either found non-tuberculous or placed in the category of suspects. The final result was as given above.

(To be continued.)

THE STREPTOCOCCUS IN CHOREA.—Dick and Rothstein (*Journal of American Medical Association,* October 11, 1913) describe a streptococcus isolated from the throat of a patient who had had chorea for five years. Similar organisms have been isolated from more acute cases. It forms a heavy, dirty-white growth on blood-agar with a raised border and a wide zone of hemolysis. It grows aerobically and otherwise equally well on all ordinary media. It ferments milk with slight acid production but without clotting it. It does not ferment dextrose, lactose, mannite, inulin or saccharose. On agar slants it is a Gram-positive organism occurring in irregular groups and short chains with an abundance of smaller Gram-negative forms, suggesting a mixed culture. In milk it grows in extremely long chains and staining shows no capsule. The intravenous injections of a dog with four agar slants produced choreic movements within twelve hours.—*The Universal Medical Record.*

THE THEORIES OF ACIDOSIS AND ACIDOSIS IN CHILDREN.

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We will first take up a general discussion of the phenomena of so-called acid intoxication, outlining the explanations which have been advanced from time to time to explain these phenomena, and then consider some of the manifestations of acidosis in the diseases of children.

The term acidosis is used to designate a pathological condition, first clearly pictured by Naunyn, in which acids arise in the course of metabolism. It is not easy to determine in every case whether the acid owes its origin to abnormal formation, or to imperfect destruction of some compound ordinarily generated in intermediary metabolism and at once subjected to further decomposition. There are several ways in which these acid products may become a source of harm, both from the withdrawal of the body alkalies, and also in the case of some of the organic acids, from the direct toxic effect of the acid molecule.

Whatever the mode of its generation, the most interesting feature of the general condition of acidosis is the accompanying increased elimination of ammonia. When mineral acids are introduced into the body, or organic acids are formed by some unusual circumstance within it, they are at once neutralized by ammonia, the nitrogen elimination in other types of compounds being correspondingly diminished. The dangers of acid intoxication are thereby avoided, and the fixed alkali content of the blood and tissues protected from loss. Thus the elimination of proportionately large quantities of nitrogen in the form of ammonium salts is to be referred not to any increased catabolism resulting in ammonia production, but rather to acids which have neutralized it prior to its conversion into urea. Of the possible conditions which might initiate such an excretion there are many. The intermediary production of lactic acid, B-oxybutyric, diacetic, glycuronic, oxalic acid, etc., suggests the types of acid compounds which may be formed. Mineral acids (phosphoric and sulphuric) may likewise arise in metabolism, but as a rule the quantity of these is far too small to account for the high ammonia output in many pathological conditions, and it is necessary to assume the production of a considerable portion of organic acids.

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* From the Department of Pediatrics, University of Michigan. Read before the Senior Class, May, 1913.

When the quantities of the chief bases, sodium, potassium, calcium, magnesium and ammonium, and the chief acids, sulphuric, phosphoric, hydrochloric and uric, eliminated in the urine are compared, or balanced, any excess of the sum of the bases over the equivalent sum of the acids may at once be referred to the presence of unknown organic acids. In certain cases the acids may unite with other bases than ammonia, so that in these cases the extent of ammonia output, the ordinary measure of the degree of acidosis, is not reliable. In such instances the balance of acids and bases must be depended on for more reliable indications.

In many cases of acidosis the factor appears to be lactic acid, to which some would add various amino-acids; leucin, tyrosin, alanin and glycocoll. Much of the lactic acid doubtless is referable to carbohydrates; some of it may be derived indirectly from proteids. Contrasting these facts with the presumable origin of the pathological organic acids of diabetic urine from fats, it appears likely that acidosis as a condition can be brought about through imperfect intermediary metabolism of all the types of foodstuffs—fats, carbohydrates and proteids.

An interesting disturbance of metabolism closely related to the phenomena of typical acidosis has been disclosed in connection with imperfect fat absorption from the intestine. This has been noticed especially in infants and will be discussed in detail later.

An instructive difference is found to exist between the acid and alkali metabolism of carnivora and herbivora. For carnivorous animals it is easy to name the sources of the acid products of metabolism. They are found in the high phosphorus and sulphur content of the proteid molecule. They appear in the long series of fatty acids which form the combustion products of the fats. They arise also in the series of changes in carbohydrates from glycogen through glucose to lactic acid. From all these foodstuffs, especially the proteids and fats, the main tendency in metabolism is toward the production of acids. The exclusive flesh diet of carnivora increases this tendency, but the mixed diet adopted by man includes one prominent contrary factor in the rich alkalies of vegetables cells; while in herbivora the conditions are least favorable for the accumulation of acids in food metabolism. However, fortunately for the carnivorous animals, and for omniverous man, they have the power of neutralizing the acids with ammonia, a power which the herbivora do not possess. This ability has been shown by experiment not to be due, as was once supposed, to any inherent difference in the metabolism of the two groups, but merely to the larger and more readily available supply of nitrogen in the high proteid diet of the carnivora. It was shown by Winterberg that rabbits may protect themselves to a certain extent by the formation of ammonia, and are less susceptible when on a proteid diet. There is a difference, however, in the readiness with which these animals utilize proteids in the formation of ammonia, and this difference, Eppinger finds, depends on the size of the pancreas in the two animals. In the rabbit the pancreas is small, and whole proteids or their complex cleavage products are slowly broken up in the intestine. A depancreatized dog Eppinger found to be more susceptible to acid poisoning than the rabbit. These facts may be of significance in connection with the pancreatic lesions of diabetis. According to this view a deficiency in the digestive function of this organ may reduce the supply of absorbed amino-acids and the ammonia available for the neutralization of fatty acids, and thus favor the development of acid coma.

EXPERIMENTAL BASIS OF ACID INTOXICATION.

The first clue pointing to the occurrence of acid intoxication appeared in the works of Boussingault, who in 1850 found that diabetic urines usually contain very large amounts of ammonia. Boussingault's methods and results were immediately attacked by contemporary investigators, and the prevailing opinion at that time, also backed up by experimental evidence, was that administration of acids entailed no great loss of alkali in the urine and no serious disturbance of the alkalinity of the blood. Following this, Miquel, by administering sulphuric acid by mouth to dogs, and Salkowski, by poisoning rabbits with taurin which yields sulphuric acid in the body, demonstrated extensive loss of alkali in the urine, while Lassar, by direct titration with acetic acid, found marked loss of alkalescence in the iced blood of animals poisoned by acid.

The pathological significance of the withdrawal of alkalies by administration of mineral acids seemed to be placed beyond doubt by the work of Walter, who showed that 0.9 gms. of hydrochloric acid by mouth *per diem* was constantly fatal for rabbits, and that the carbon dioxide content of the still faintly alkaline blood of such animals was greatly reduced. Organic acids, in his hands, were without comparable effect.

The symptoms of the acid poisoning appeared to be characteristic. The respiration was accelerated and the inspiratory movements were deeper and labored, while the blood pressure rose with tumultuous heart action. Later the dyspnea ceased, respiration failed, the heart became feeble, and blood pressure fell.

The study of the effects of administration of acids in animals has been pursued by many observers during the past thirty years, with the result of greatly extending and, in the main, confirming the conclusions of Walter, and these results have furnished the main experimental basis of the doctrine of acid intoxication.

Typical acid intoxication has been produced by Kobert in rabbits with phosphoric acid, and by Spiro with acid sodium phosphate, but in dogs the acid effect was obscured by the action of the salt. Eppinger produced the usual symptoms of acid intoxication in rabbits by lactic acid.

The explanation of the toxic effects of the withdrawal of alkalies from the blood and tissues is suggested by the diminished alkalescence of the blood and its lowered content in carbon dioxid. In fatal acid intoxication the blood may contain only 2 or 3 volumes per cent. of carbon dioxide, as compared with the normal 28 to 40 per cent., and Spiro found only 1.6 volumes per cent. in the blood of a dog receiving acid sodium phosphate. As to the diminished alkalescence of the blood, Szili infused ⅛ N/HCl into the jugular veins of rabbits and dogs, 2 c.c. per minute. The rabbits survived about one hour and their blood alkali fell 78 per cent., while dogs succumbed in about thirty-five minutes, and their blood alkali fell 75 per cent. It is to be noted that in none of these experiments was the oxygen of the blood reduced.

This view that acid intoxication kills by asphyxia of the tissue cells from accumulation in them of carbon dioxide, has not passed unchallenged. Loewy and Münzer believe that the production of CO_2 is diminished, and this belief may be supported by the reduced consumption of many acid products of metabolism, resulting in lessened CO_2 formation in diabetes. Other observers have found that the blood in diabetes is able to absorb a normal amount of CO_2, even when its alkalinity and actual CO_2 content are greatly reduced. While the conception of cellular asphyxia is valid as far as it goes, further knowledge of the condition determining the vitality of cells seems necessary before this theory can be regarded as proved.

It has further been surmised, but not satisfactorily proved, that vital organs are rendered seriously deficient in alkalies by administration of acids. An increased loss of alkali in the urine was demonstrated by Salkowski, in taurin poisoned rabbits. But some of this urinary alkali is certainly diverted from the feces, which is the normal channel of 90 per cent. of the alkali excretion. Moreover, the body possesses practically inexhaustible supplies of alkaline earth in the bones, and it still appears doubtful if these depots are not sufficiently available in acid intoxication to maintain the necessary alkali of vital tissues. The alkali content of such organs as the liver, kidneys and brain, in experimental acidosis, has apparently not been determined. Yet in diabetes Frerichs states that the bones are abnormally light, and von Noorden concludes that the bone alkalies are extensively drawn on in diabetic acidosis. It is therefore probable that the bone salts are available in chronic acidosis, but not in the acute forms.

According to Moore, the alkalinity of the tissues depends on interchanges of mono-sodium and disodium phosphates, and by virtue of alterations in the relative amounts of these salts the cells may take up considerable quantities of acid without change in their reaction. Hence Bainbridge advances the theory that by some interference with this protective mechanism of the phosphates and carbonates the tissues can no longer get rid of the acid produced and that their accumulation in the cells brings metabolism to an abrupt close.

An important phase of the question of blood alkalescence has been revealed by the work of Rzenkowski, who throws considerable doubt upon the validity of the methods that have been used to determine this property of the blood in acidosis. He titrated separately with H_2SO_4 and litmus, the whole blood, the plasma and the cells. His results indicate a remarkable preponderance of acid-neutralizing power in the red cells. The red cells owe their basicity to proteins, and the plasma chiefly to minerals, and loss of basicity in red cells may be due not to loss of protein, but to qualitative changes in the protein, such as the capacity to split off ammonia. Hence the effect of acids in the blood is very imperfectly measured by the loss of alkali and probably also by the loss of carbon dioxide. These results also lessen the significance of data obtained by the estimation of the hydroxyl ion concentrate, for here is a type of basicity which is only distantly connected, if at all, with hydroxyl ions. In any case, since the blood must probably first feel the effects of any excess of acids produced in metabolism, it is quite unwarranted to assume diminished alkalescence of other organ cells until that of the blood has been definitely proved.

Another fundamental chapter in the rôle of ammonia in physiology and in the conception of acidosis concerns the relation of ammonia to urea-formation and to the functions of the liver. For the purpose in hand it will suffice to summarize the results obtained after the production of the Eck's fistula and after total extirpation of the liver.

When the functions of the liver are abolished animals die with very pronounced nervous symptoms, extreme loss of urea nitrogen, high ammonia nitrogen, and the presence in blood and urine of carbamic acid and ammonia, the chief antecedents of urea, and with considerable lactic acid. The urinary signs of acidosis are pronounced and in many respects similar to those seen after experimental acid poisoning, but in the case of the Eck fistula no increased formation of acids has occurred, no abstraction of tissue alkali can be assumed, and death must result from some different mechanism, possibly from intoxication with accumulating antecedents of urea. After extirpation of the liver more complicated processes arise, marked by increase of lactic acid and by excess of ammonia from failure of urea synthesis and probably from diversion of ammonia for the neutralization of acids.

Having thus discussed at some length the experimental basis and theories of acidosis, let us now turn briefly to the clinical development of the doctrine of acid intoxication.

The clinical status of the whole subject of acidosis appears to depend on its position in diabetes, and it is in connection with this affection that the clinical development of the theory has occurred.

In 1857 Petter showed that the penetrating odor of the breath of diabetics is caused by acetone, and he first referred the coma of diabetes to acetone poisoning. Later Kaulich described a group of nervous symptoms as a characteristic clinical picture of acetonemia. In 1874 Kussmaul drew attention to the peculiar clinical features of certain cases of diabetic coma and sharply distinguished them from Kaulich's acetonemia. These features were, the characteristic form of dyspnea, the "gross atmung," a rapid and weak heart action, nervous excitation, hypogastric pain, and coma. Kussmaul concluded that this form of coma was caused by a direct stimulus of the respiratory center by some intoxication arising in the course of the disease, and not from loss of oxygen, or accumulation of carbon dioxide, or from acetone poisoning.

The first demonstration of acid substances in the acetone series was accomplished by von Jaksch, who in 1883 showed that the ferric chlorid reaction in diabetic urines was due to the presence of diacetic acid. Von Jaksch firmly believed in the direct toxic action of acetone and diacetic acid.

It was an essential contribution to the subject when Statelmann, by balancing the known acids and bases, proved that diabetic urine contains a great excess of bases over that required to neutralize the inorganic acids, and hence that some unknown organic acid must exist in the highly acid urine. This work was followed by the demonstration, by Kulz and Minkowski, of beta-oxybutyric as the questionable acid in diabetic urine. Various other observers have subsequently isolated other organic acids from diabetic urines, as lactic, sarcolactic, and volatile fatty acids, but Magnus-Levy criticizes the methods employed and believes that such products are chiefly derived from changes in beta-oxybutyric acid.

Since the relation of these acids to symptoms must be determined not solely from their presence in the urine, but from evidence of their existence and action in the body, it is necessary to inquire to what extent the other features of Walter's acid poisoning are represented in diabetic coma. To this end, it has been demonstrated by Minkowski, Kraus and Magnus-Levy that both the CO_2 content and the alkalinity of diabetic blood are markedly diminished, and beta-oxybutyric acid has been isolated in considerable quantity from the blood of such patients. Magnus-Levy, however, reports cases with large amounts of beta-oxybutyric acid in the urine but with no symptoms of coma, as well as cases which went into coma with a practical absence of this acid in the urine.

The successful effects of alkali therapy in some cases of coma are held by some to further extend the parallel between diabetic coma and Walter's acid poisoning, but even here the evidence is far from conclusive, and the failures of this treatment certainly far outnumber the successes. It must be admitted that the good results of injection of sodium bicarbonate may be due to other than the acid-neutralizing properties. Thus in a case of Young's, coma subsided after venesection and injection of salt solution, and Hilton-Fagge relieved another by infusion with the acid mixture sodium chlorale and sodium phosphate! Finally it is admitted that typical coma may develop during the administration of alkali and while the urine is alkalin.

Various attempts have been made to offer explanations and hypotheses which may account for these conflicting data, and still leave the theory of acid intoxication a tenable hypothesis. For instance, it is maintained by Naunyn that there are several types of coma in diabetes, some of which are due to acid intoxication and others are not. Another line of argument is based on the possibility that the alkali when administered may not reach the acid in time, or in sufficient quantity to neutralize it, or that the acids before neutralization cause in the organs changes which themselves prove fatal, even after the acids are neutralized.

It might be expected that considerable light would be thrown upon the subject by an investigation into the occurrence, source, chemistry and physiology of the acetone compounds. Ewing, after an extensive investigation of this nature, comes to the following conclusions:—

(1) While all the classes of food stuffs yield acetone compounds in the test tube, yet in the body these compounds are derived mainly from the fat tissues and to a less extent from the food. In diabetes, however, the proteids contribute directly or indirectly to the formation of acetone compounds. To what extent the proteids are drawn on in other conditions remains uncertain.

(2) The complete combustion of fats requires the simultaneous catabolism of carbohydrates, in the absence of which there is defective and possibly abnormal cause of fat combustion lodging in the acetone compounds. In all known conditions, even

diabetes, the metabolism of carbohydrates occupies a controlling position in this form of acidosis.

(3) Oxidation of straight chain fatty acids occurs at the beta-carbon atom, so that such acids with an even number and at least four carbon atoms may yield beta-oxybutyric acid. Oxidation of pure fatty acids in the test-tube may occur at the alpha-carbon atom, with avoidance of acetone compounds, but whether this course may be followed in metabolism is uncertain. From branched fatty acids a methyl group may be replaced by hydroxyl, and in amino-acids oxidation occurs at any carbon atom holding an amino group, both of which processes may yield beta-oxybutyric acid.

Knoop's work and the ready destruction of beta-oxybutyric acid in healthy men indicate that this acid is a normal product of metabolism.

(4) The urinary ammonia is influenced by the total nitrogen excretion, by the presence of fatty acid derivatives, by lactic acid, possibly by inorganic acids, and notably by defective synthetic functions of the liver. It bears rather loose relation to the acetone compounds, and being an indirect measure of the presence of acids cannot replace their direct estimation.

(5) The grounds are still inadequate to support the view that acetone compounds, as they arise in the body, exert any notable direct toxic action.

(6) Oxidation and hydrolysis are both concerned in the formation of acetone compounds.

(7) Lactic acid is a product of disordered or defective catabolism chiefly of glycogen; it results also from disturbed function of the liver and bears an important relation to fatty degeneration.

It is to be noted that these observations, while interesting and evidently important, by no means clear up the vexed questions of acidosis, and in spite of the prodigious labor devoted to the subject over a period of thirty years, it is evident that the existence of an acid intoxication arising in the course of disease has not been placed beyond the field of debate. The practical value of the theory as a basis for hopeful therapeutics is its strongest plea for acceptance, and here, at the same time, is presented its most potent weakness. It appears most probable that in diabetes there is some essential process which is responsible both for the acids and the coma, and that a successful therapy must attack this earlier process.

While it would be interesting to consider here the various clinical types of acidosis that have been described, such as the acidosis of starvation, acidosis in pregnancy, acidosis after anesthesia, coma dyspepticum, asthma acetonicum, acidosis of cancer, acidosis in psychosis, febrile acetonuria, and many others, with the exception of those which are peculiar to infancy and childhood, such a study is beyond the scope of this paper.

Although children are subject to practically all the forms of acidosis that affect adults, there are one or two types of acid intoxication which are peculiar to the early years of life, and to these we will now turn our attention.

One such condition is cyclic vomiting. There are several types of periodical vomiting in children, and in one of these acidosis is prominent and acid intoxication has been urged as the essential pathogenic factor. This view, however, as will presently appear, is by some stoutly opposed.

Characteristic cyclic vomiting occurs only in children, usually in neurotic subjects, at frequent intervals, not connected with dietetic errors, and not relieved by vomiting or purging. The vomiting is very severe, and the vomitus may contain mucus, bile, blood, acetone and indol, and is accompanied by great prostration, but not by pain. There is restlessness, headache, and there may be delirium, convulsions and coma. Respiration is rapid, sighing and irregular. The attack usually lasts but a few days, but may be continued for two weeks or prove fatal in forty-eight hours. The urine before the attack may contain much indican, increased uric acid, and some acetone; during the attack it is diminished, with less indican and uric acid, more acetone compounds, and often with albumin, casts, or blood.

Several theories of the nature of this disease have been maintained. The theory of a gastric neurosis applies to one predisposing element. Rachford believes that the malady is a lithemic condition allied to migraine, and in one of his patients the attacks changed to migraine as the patient grew older.

The acetone compounds have been found in the urine and breath by Edsall and others, and Edsall has urged that the disease is a form of acid intoxication.

Several observations favor this hypothesis. Although quantitative estimations of the acetone compounds have not been made, the reactions in the urine have often been pronounced, and the breath may give a strong odor of acetone. Acetone may occur in the urine before the attack. It may appear in the vomitus, suggesting that the vomiting is an eliminative mechanism. Edsall states that the respiratory disturbance resembles that of diabetic coma and he strongly recommends alkali therapy, while he and Pierson assert that they have cured some and prevented other attacks by this method. On the other hand, the acetone compounds do not appear to be present in quantities sufficient to account for the severe symptoms, and their toxicity is slight. Also these symptoms occur very readily in children not presenting the symptoms of cyclic vomiting, and the resemblance of the dyspnea to that of acid coma has not impressed the majority of observers. The good effects of alkali therapy here, as in diabetic coma, may be referable to other actions than the neutralization of acids, while this treatment may fail and other forms of treatment may be equally or more effective.

The most complete work upon the subject of cyclic vomiting seems to have been done by Howland and Richards, who in a series of cases found acetone compounds and lactic acid arise in the ratio of neutral to oxidized sulphur, and heavy indicanuria, which diminishes during the attack. All these urinary signs they interpret as evidence of deficient oxidation by the body cells. They argue that the rise in uric acid must represent endogenous neucleoproteid metabolism, since exogenous sources of uric acid are reduced with the scanty diet of the patients. They attach great importance to the presence of much indol, phenol and skatol in the urine, and conclude that cyclic vomiting results from deficient oxidation, brought about in predisposed subjects by nervous disturbance, and leading to failure to detoxicate products of intestinal putrefaction, and of internal metabolism.

In addition to this somewhat special recurrent type, the ordinary gastroenteritis of infants has been found associated with the presence in the urine of all the acetone compounds, and the nervous symptoms of many of the cases suggest a relation to acetonuria.

Keller, after estimating the total nitrogen and the ammonia-nitrogen excretion of a large number of infants ill with gastroenteritis, was unable to read any positive conclusion from the increased ammonia excretion which he found. He says:

"If we find in gastroenteritis an increased ammonia excretion, we must further determine whether this results from a sulphur production and increased excretion of acids, or from a disturbance of the urea-forming function of the liver. The latter conclusion could probably be assumed if one could prove that the other functions of the liver were disturbed and this might be done if one could exclude an increased formation and excretion of acids. On this account we must determine whether an acid intoxication really exists. This allows of direct proof through the estimation of the acids and bases of the urine and through the quantitative estimation of the blood ash; indirectly through the observation of the ammonia excretion. If the increased ammonia excretion arises from surplus production of acids, then it must be influenced by the administration of alkalies. These bind the acids, and the ammonia will, as under normal conditions, change into urea and as such appear in the urine. In this way it may be determined whether, in addition to an acid intoxication, a lessening of urea formation also occurs, and in these cases the ammonia excretion will not be reduced to the normal amount, but only to a certain limit. But even if it should appear that in all cases the increased ammonia excretion arose through acid intoxication, still we could not overlook the condition of liver degeneration in gastroenteritis, a condition to which Thiemick has recently directed our attention."

In Keller's cases, so far as they came to autopsy, he found a more or less high grade fatty degeneration of the liver, and, indeed, the severest forms occurred in children in whom he had found increased ammonia excretion in life. In one case with a lessened ammonia excretion the histological findings were normal.

He concludes, therefore, that the liver stands, although perhaps only indirectly so, in relation to the increased ammonia excretion, and that liver degeneration occurs in connection with acid intoxication.

Somewhat more definite were the results subsequently obtained by Czerny and Keller, who studied the part played by the different constituents of the milk in producing acid intoxication in infants ill with gastroenteritis. Since the individual ingredients of milk could not be fed separately with success, different kinds of milk were used, in which one or another of the constituents predominated to a large extent. For testing the influence of the proteids an undiluted cow's milk, from which the fat up to 0.1 per cent. was removed, and which contained 3.5 per cent. of proteid, was used. To test the fat a 17.5 per cent. cream, containing 2.7 per cent. proteid, was used, which was diluted somewhat with water. Finally, to judge the effect of lactose, the infants were fed with the above fat-free milk, diluted with two parts of water, to which a daily amount of 2.5 gm. of lactose were added. The children got five feedings in twenty-four hours, and the individual child in the different trial periods received approximately the same daily amount. Because the children and their diseases were not completely of an even value on one and the same child, as many trials as possible were made.

The least influence on the ammonia excretion was found by feeding with the high protein food. The numbers giving the relation of the ammonia-nitrogen to the total nitrogen, expressed in percentage, varied between 1.1 and 5.5 per cent. These correspond to the numbers given as normal for the adult. That the large amount of protein given was practically all absorbed was shown from the high values found in the total nitrogen excretion.

Likewise it was shown that the influence of the acid products of lactose is very small, and therefore this substance cannot be used to explain the high figures of ammonia excretion in gastroenteritis of children.

Especially remarkable results were produced with the fat-rich milk. Here the proportion of ammonia-nitrogen ran up very high, reaching a maximum of 33.7 per cent. The experiments showed that by regularly decreasing the fat content of the milk the figures for ammonia excretion were reduced, and by adding fat were increased, even to such figures as are found only in severe pathological changes of the organism.

It was noticed, however, that with an increased introduction of fat in nutrition the ammonia excretion did not increase in the same proportion. This may have its explanation either in the fact that the advancing of ammonia for neutralizing acids is possible only within certain limits; or in a failure of all the fat to be absorbed. This point the investigators were unable to decide.

That with increased intake of fat, excretion of acids and ammonia is increased, may be due to two causes—either abnormally large amounts of acid are formed which, even with the normal oxidation powers of the organism, cannot be burned up, or the function of oxidation is so far lowered that even a normal amount of acids partially passes through the body unchanged, not to speak of pathologically large amounts.

The significance of these facts is to be found in this, that with rich fat intake the organism is obliged to supply ammonia for neutralization of acids, and therefore constantly to make use of a protective mechanism which under normal conditions is not used, and of which we are not justified to suppose that its function is an unlimited one.

To the same degree it is important to emphasize the fact that the fatty acids which leave the organism unoxidized must be considered in computing the caloric value of the food, because it must give rise to error if we compute the caloric value of a food from the sum of the calories introduced by the food, without determining how many calories must be deducted from the total sum if a part of the introduced ingredients is eliminated by the body unburned. This must be considered in the healthy child, but especially in the infant sick with gastroenteritis, where a disturbance of the powers of oxidation is present.

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CIRCULATION IN DIPHTHERIA. — Creutzfeldt and Koch (*Virchow's Archiv. Berlin,* Vol. CCXIII., No. 1) state that the circulation frequently fails in diphtheria before there are any clinical signs of change in the heart, and that on autopsy the heart lesions are frequently insufficient to account for the severe atony of the vascular system. They believe that the hypophysis is partly responsible for this atony, and their belief is confirmed by the marked rise in blood pressure brought about by hypophysis extract. In 7 cases of death from heart involvement in diphtheria, they found profound changes in the pars intermedia of the hypophysis. These same changes were produced in guinea-pigs by the injection of pure cultures of diphtheria bacilli. A combined epinephrin-hypophysis extract therapy should be used in cases of diphtheritic heart involvement.—*The Universal Medical Record.*

A REVIEW OF THE LITERATURE ON OSMOSIS AND EDEMA IN INFANCY AND CHILDHOOD.

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For many years there has been recognized an edema in infants and children, and it is not surprising that in the earlier days, with the more imperfect technic and methods of examination, no pathology could be found to account for it. But the fact that even up to the present day we are uncertain as to the methods of its production, though several theories have been advanced, makes the question a more interesting one.

These peculiar edemas have been noted ever since children's diseases have been studied, but the careful observation and study of the subject dates from the work of Wagner in 1887. He studied 6 cases in which he carefully eliminated heart and kidney lesions as causes of the edema, and he also excluded anemias, cachexias, and every other known cause of edema. To this peculiar class of edema he gave the name of essential, primary or idiopathic edema, which has clung to it all through the literature. Such cases are more frequent in children than in adults and are of greater importance because of their serious nature if unskilfully treated.

The chief characteristics of the idiopathic edema in children are as follows: Wagner described it as always generalized and usually very marked, affecting the body from the thorax down, and including the serous cavities in some cases. The eyelids and wrists were also usually involved. The localized edemas he believed to be of rheumatic and angioneurotic origin. The urine is clear and free from albumin in all cases and of apparently normal amount. The skin and mucous membranes are usually pale, and there is in most cases an anemia. In many cases there are symptoms of enterocolitis with vomiting and frequent putrid (and sometimes bloody) bowel movements, loss of weight and fever. The onset of the edema is very rapid, and in one to three days it may reach alarming proportions. A few cases show purpura with the edema. The course varies with the treatment. Some cases clear up in two or three days on a milk diet and caffein; others have a very protracted course of several weeks and clear up only under a very careful diet; while a third group after a protracted illness end fatally. The clinical picture, however, is never that of a nephritis, the patient never having the "nephritic" look, and never going into uremia at the end. The prognosis of the edema itself is favorable, but in many cases the underlying cause being unknown the treatment is empirical and the course unfavorable.

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* From the Department of Pediatrics, University of Michigan. Read before the Senior Class, May, 1913.

Concerning predisposing factors all investigators agree. Wagner thought that heredity played only a slight rôle and that environment played a still slighter rôle. He decided that artificial feeding seemed to be a factor. Hutinel found premature children to be more susceptible than full-term children. Other predisposing factors agreed upon by various workers are exposure to cold, coryza, tonsillitis, preceding skin diseases (especially scarlet and erysipelas), infectious fevers, as typhoid and intermittent fever, inanition fever, and, last but not least, gastrointestinal disorders, in which it occurs very frequently.

We now come to the question of etiology, concerning which there are three principal theories. These are: (1) that there is at the bottom a latent or hidden nephritis, (2) that there is a chlorid retention which leads to a hydremia and so to an edema, and (3) that there is an increased permeability of the capillary walls.

The theory that there is at the bottom of the trouble a latent or hidden nephritis finds its chief advocate in Cassel, who reported in 1900 a series of 9 cases of from six weeks to two and one-half years of age. Four of these cases had been preceded by exanthema. In all the cases that came to autopsy albumin and casts had been very carefully searched for, but were never found. The heart at autopsy was found to be normal, but the kidneys were much congested and the tubules full of tissue detritus. Cassel is a little doubtful as to the significance of such findings because of the absence of albuminuria, but finally suggested that a hidden nephritis might be at the bottom of the whole trouble. He believes that the occurrence of an exanthem preceding the edema in so many cases speaks in favor of his theory. Against this theory are the facts that the clinical picture is never that of a nephritis, the flow of urine being free, and the exodus not that of a nephritis. A latent nephritis, it is also found, sooner or later shows itself. This occurred in none of his cases. The recovery in two or three days to two weeks speaks against a nephritis, which if severe enough to cause such an edema would not clear up in so short a time. The distribution of the edema is also against a nephritis. The nitrogen elimination being normal, it can hardly be looked upon as a functional nephritis. On the whole, this theory seems scarcely tenable.

The chlorid retention theory has many advocates. The supporters of this theory have as a starting point the fact that healthy kidneys eliminate both liquid and solid waste products, and in disease the solid constituents are the first to fail of elimination. Na. Cl., being one of the most important of these, is also one of the first retained. Castaigne and Ratherty studied the action of Na. Cl. on renal epithelium and found that a solution of greater concentration than that freezing at 0.78°C. injured the secreting epithelium, and so increased salt concentration sets up salt retention, and in consequence a vicious circle is set up. This last observation has been corroborated by Widal, Javal and Goodall. One of the first advocates of this theory as explaining idiopathic edema was Hutinel, to whom the part played by salt in the production of edema was suggested by the work of Widal and Javal. These two workers were able to make the edema of a chronic parenchymatous nephritic adult come or go by simply giving or withholding Na. Cl. in the diet. Hutinel, in working along this line in the idiopathic edema of childhood, found that the edema developed most frequently in children who had had faulty artificial feeding and had developed an acute or chronic enterocolitis, due to over, rather than under, alimentation. He believes that at a given moment the soluble substances (chiefly Na. Cl.) are in these cases in greater concentration in the tissues than in the blood and so by the laws of osmosis an edema results. He believes that three factors operate in the retention of the Na. Cl.: (1) a lessened permeability of the organs excreting salt, chief among which are the kidneys; (2) a faulty circulation in both the heart and vessels, and (3) an altered tissue activity affecting the osmotic pressure. All three factors do not operate in all cases, for in some, one factor predominates; in others, another. For example, in some cases the chlorid retention is the chief factor, for injection of Na. Cl. in wasting infants sets up an edema; or an already broken compensation or weakened circulation would lessen tissue activity and aid the other two factors; or, third, in the grave entercolitidies, the tissue nutrition must of necessity suffer more than the circulation or the kidneys. Finally, in support of his views, Hutinel was able, like Widal and Javal, to make the edema come and go by changing the chlorid intake. Cowie's work on the pyloric reflex in infants led to facts in support of this theory. He had occasion to give Na. HCO_3 to infants. In one case the child showed an irregular fever in two days, and on the third the child showed an edema. The fever he concluded was a salt fever, and the edema was also probably due to a salt retention, the salt being formed by the action of the excess HCl in the gastric juice on the Na. HCO_3. That this was probably true is shown by the fact that on discontinuing the Na. HCO_3 the fever fell and the edema disappeared in two days. L. F. Meyer's work in 1905 led him also to the conclusion that the salt in the diet was the offending factor, due to a functional salt retention caused by renal insufficiency. Stahlein, in attempting to solve this question, took the specific gravity of the blood of such patients to see if it was hydremic and found it practically normal or only very slightly more dilute.

The theory of increased vascular permeability has also many supporters. Cohnheim was the first worker to advance this theory. He injected salt solution subcutaneously, but got no edema unless the skin had previously been irritated in some way, as by cantharides or sunburn. From this he argued that in the idiopathic edemas there was a circulating toxin which acted on the vessels walls, causing an increased permeability in them. That there are compounds which possess such an action has been proven by the action of snake venom and arsenic. He believed that the toxin of scarlet fever, the toxic products of gastrointestinal disorders, the exanthems, etc., in this class of cases, operated in the same way.

The next investigation supporting this theory was that of Wagner (1887), who found that several factors operated in the etiology of the essential edemas. To the three factors described by Cohnheim, *i.e.*, blood changes, weakness of the heart's systole and changes in the vessel walls, he added the fact that changes in the skin were found in some cases, such as peculiar lymphoid changes in the subcutaneous fat and thrombosis of the cutaneous veins. He believed, however, that the thrombosis was probably secondary to the edema and slowed circulation. He agrees with Cohnheim that it is only rarely that one factor acts alone.

Filatoff, in 1897, who was another worker on this theory, believed that edema without albuminuria could have two origins—on the one hand (rare) it rests on the latent nephritis; on the other no renal lesion exists. He reaches the conclusion that hydrops is due to two factors—first, a lack of nourishment to the vessel walls, and, second, a certain grade of hyposystole—both of these being due to the absorption of an intestinal toxin which aided the hydrops by causing increased permeability of the vessel walls, and a weakening of the heart muscle.

Stoltzner, in 1905, published some researches in support of this theory. He thinks that the same toxin which makes the kidney permeable to albumin makes the capillary walls pervious to water. In such cases we have nephritis and edema. In other cases the capillary walls are involved and this gives rise to an essential edema. At the other end of this series are the nephritides without edema, but with albuminuria, in which only the kidney is involved, by the action of the toxin.

As far as therapeusis goes, and it is, after all, the practical point at issue, there seems to be only one course of treatment open to us, and that is one involving a low chlorid intake. If the cause of the edema is a chlorid retention, as seems to have been shown, a lessening of the chlorid intake would improve it. Or if there is an increased permeability of the vessel walls due to the toxins absorbed in a chronic enterocolitis, it can be improved by lessening the irritation of the gastrointestinal tract by giving a low chlorid diet. The results of a method of therapeusis involving a diet with a low chlorid content are generally satisfactory, as shown by (1) Meyer, who used breast milk, or whole milk diluted with cooked flour and sugar solution; by (2) Cowie's experiments; (3) by Filatoff; (4) by Wagner; and, in fact, by all workers on this subject, whether adherents of the one theory or the other. Those favoring the circulatory lesion give milk and caffein; the latter is a cardiac stimulant. They explain their good results by the fact that, the circulation being improved, the nutrition is also improved and so the vascular lesion is repaired. But it has been found by Javal (1905) that the members of the caffein group also cause an increased output of Na. Cl. when used in connection with a diet poor in chlorides, so that the beneficial effect of caffein in these cases might be explained in accordance with the chlorid retention theory by saying it gets the salt out of the body in obstinate cases of retention when the salt-free diet alone would not do so.

And so in the light of present knowledge the weight of evidence seems to be in favor of the chlorid retention theory of infantile or essential edema, although the vascular lesion theory has many points in its favor; and the treatment most successful is the reduction of the salt intake to a minimum, particularly in premature infants, and in severe cases to give caffein.

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SCARLET FEVER IN THE AGED.—Ker finds that only 20 undisputed cases of scarlet fever have occurred in persons over sixty in a total of 263,986 cases, and of these only two were in persons over seventy. He reports a case (*Edinburgh Medical Journal,* December, 1913) in a man of seventy-four. The rash was typical, and but for the age of the patient there would have been no hesitation about the diagnosis. He was seriously ill, and had albuminuria (eighth day), otitis (eighth day), and arthritis (fourteenth day). He was discharged on the forty-seventh day, desquamation having started on the fifteenth.—*The Universal Medical Record.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held December 18, 1913.

William K. Polk, M.D., President of the Academy in the Chair.

MEDICAL SOCIOLOGY IN THE PUBLIC SCHOOLS.

Dr. Mary Sutton Macy said she had been asked to tell what the public schools were doing for the physical care and welfare of the children, which should be known to the medical profession. The public schools of New York City were of two kinds—(1) The larger number, about five hundred elementary schools and twenty-five high schools, supported by the public money under the Department of Education, and (2) the thirteen day schools and eight evening industrial schools maintained by the Children's Aid Society, with some coöperation from the Department of Education. Besides these there were parochial and other Church schools which did not come within their summary at this time. The Children's Aid Society, in addition to the schools mentioned, maintained the so-called "soup schools," which provided lunches for children as well as clothing and other necessities. The Society also maintained dental clinics in connection with its schools and the teachers and social workers were most eager to coöperate with any suggestion offered by the clinics with which the speaker was connected. The Department of Education also effected a great deal of social service bordering on philanthropy in the course of its routine work.

Medical inspection in the public schools was under the Department of Health Bureau of Child Hygiene. The corps of doctors and nurses attached to this Bureau made regular and routine inspections of the children, or as many of them as possible, and succeeded in excluding almost entirely contagious diseases. They had in this city no serious school epidemics in these days and the Bureau deserved full credit for this relief. Many other points were included in medical inspection—defective teeth, palate, vision, hearing, nasal breathing, hypertrophied tonsils, etc. Recommendations for proper treatment were made or supposed to be made to the parents or guardians. The best results in this work were secured where there was coöperation between inspector, school authorities, and the home, but not always so good when one of the trio slipped in the coöperation, as was too often the case.

The remaining fields of medical sociological activity were entirely under the direction of the Board of Education, if they excepted the school lunches which were served in twenty-two elementary schools of Manhattan and Brooklyn as experimental efforts to demonstrate their value and effect. Another field of work which should be mentioned was the new Department of Educational Hygiene, being organized under Dr. Crampton, which it was to be hoped would take some effective notice of the hygiene of the teacher. Dr. Macy said she had elsewhere tried to point out the demoralizing effect on a whole school of a sick teacher. The children should be guarded from sick teachers without doing injustice or working hardship to the teachers. As a rule, the teacher worked too long and returned too soon to work, and it was usually a matter of financial necessity. It was time that physicians took a hand in the teacher's salary campaign, for the sake of their own patients, both teachers and pupils.

Again there were special classes for the blind, the deaf, the crippled, the anemic, the tuberculous, and those suffering from trachoma, all of which deserved the attention and coöperation of the medical profession. They all presented medical problems in which each and every physician should be interested and concerning which he should be well informed. The routine of admitting children to these classes should be known to every physician in private, hospital, or dispensary practice, and the parents or guardians of such children should be put into touch with the educational people by the physician. The coöperation of the physician would be heartily welcomed, as would be his suggestions for care, treatment, nourishment, hygiene, etc.

The vocational training of boys and girls deserved medical inquiry and medical coöperation. Should it not be possible for a child physiologically more mature than his or her twelve chronological years would indicate to prepare himself in school for a congenial life work? Must he be compelled to stick to his books for two or four years more before he can begin to learn a trade and then begin without the protection and supervision that school training would give, and at the same time be handicapped by the bad habits acquired during the two or four years of laggardism or truancy? Why did not the doctors find an answer to this problem? The educators would act if the physicians could make them see.

Dr. Macy said that last she wished to speak of her own hobby, the classes for training nervous and backward and mentally defective children, the so-called "ungraded classes." There were no classes for epileptics, imbeciles or idiots, and there were no classes for the observation of nervous cases, or cases simulating amentia; neither were there classes for mental defectives or morons, but there were ungraded classes in which all these types of children were mixed together, and, unfortunately, some persons had gotten the idea that every child in the ungraded classes was a moron, an imbecile, or an idiot. As a matter of fact, the majority of children in these classes were border-line cases, or high-grade morons, and only time, treatment and teaching would determine which was which.

The time was coming when this field, so essentially medical, should have medical direction and be organized so that the present chaos of cases was sorted out and differentiated. This was an important and vital field for the physician to look into. This field required more practical medicine and less theoretical pedagogy than it was getting at present. For seven years past Dr. Smart had been examining children proposed for these classes and now these examinations were being made by two physicians and it was a medical examination and not an inspection to which the candidates were subjected. Recommendations were made that the child be taken to a specialist or to a clinic, as circumstances warranted; and when the cases were once admitted to the ungraded classes they were followed up by social workers attached to the Department to see that the needed treatments were obtained. Convalescent homes in the country were secured for cases in which this seemed to be indicated and the children were followed up on their return to the city to insure the right educational treatment following the physical upbuilding. More clinics and more physicians should be interested in actively coöperating with the doctors in this department as it stood at present. Frequently there were cases which showed no marked defect, and no pathological condition of special interest, but still such cases might require glasses, or removal of the tonsils and adenoids, or general tonic treatment for malnutrition, and all three should have medical care. Few physicians in clinics or out of them realized all the resources at the command of the poor of this city, and if there were more coöperation between the clinics and the physicians of the department of ungraded classes of the public schools the physicians would learn many things that they did not know and the children would profit immeasurably.

Dr. Macy closed by making a plea that all clinics, not only pediatric, but eye clinics, ear clinics, dental clinics, skin clinics, any clinic whatsoever, should offer its coöperation to this department of the school system, and urged that they receive all cases referred to them, report to the physician sending the case the findings and treatment, and indicate the hygienic coöperation that the school should give, and she assured her audience that they would be surprised at the results and the number and kind of cases that would be referred to them.

A STUDY OF THE RESULTS OF TONSIL OPERATIONS ON PUBLIC SCHOOL CHILDREN IN NEW YORK CITY

Dr. Gerhard H. Cocks stated that this study was based upon the examination of over 100 children selected from the Department of Health records of cases recently operated upon in the local hospitals and dispensaries. The investigation was made under the direction of the New York City Visiting Committee of the State Charities Aid Association and its object was twofold—first, to obtain information which would warrant a request for more funds from the Board of Estimate for the care of adenoid and tonsil cases in the municipal hospitals, and, second, to ascertain whether any improvement could be made in the methods now employed in the schools for the disposition and treatment of these cases.

The children examined by the writer were treated or operated upon in one or other of about thirty of the local hospitals and dispensaries and were scattered among twelve schools in Manhattan. The number of children examined and referred for operation by the school doctor was 107, the number of children evading operation, 17; the number operated upon, 90; those operated upon with general anesthesia, 33; those operated without anesthesia, 14. In the remaining 43 cases there was some doubt as to whether the children were given a general anesthesia or not. The ages of the children varied from four to fourteen years.

After explaining the method of school inspection, the writer said that if a child was found with diseased tonsils or other abnormal conditions he was referred to the family physician or clinic for treatment. The medical inspector's findings were noted on a card and filed for future reference. As the law now stood the Department of Health could not legally compel parents to have their children operated upon. Last year there were 825,000 children enrolled in the public schools of New York and one medical inspector was allotted to every 9,000 children. When one considered the large number of children examined annually by the Department of Health physicians and nurses, the difficulties encountered in the shape of opposition from parents, lack of proper examining rooms in the older type of schools, etc., it was evident that the Board of Health was carrying on a good and useful work.

There were certain defects found in the system, for example, 31 of the 107 children examined were suffering from nasal abnormalities either urgently requiring treatment or where treatment would have been highly beneficial. Apparently these cases had been referred to clinics, their adenoids and tonsils removed, but their nasal condition not attended to. So far as he knew the school doctor did not examine the anterior nares. A large variety of severe nasal conditions were noted in these children and a large proportion had carious teeth. Eighteen cases had high palatal arches, requiring correction either on account of improper development of the upper jaw and teeth, or on account of interference with nasal breathing.

The teacher's comments on the results of operation were interesting. In many cases they had noted that children were cured of recurring sore throat, earaches, mouth-breathing, etc. In many instances the general physical and mental condition of the child was improved.

The soft parts were injured in 9 of the 90 cases operated upon, some of the mutilations showing very bad surgery.

A comparison of the series of 14 cases operated upon without an anesthetic, with the series of 33 cases operated upon with general anesthesia showed that where no anesthetic was employed the results were uniformly bad, with one exception. In many of the cases portions of tonsillar tissue varying from small portions to nearly the entire tonsil still remained after the operation. Of the 33 children operated upon under general anesthesia the tonsil operation was well done in 24 cases, that is, the tonsils were either completely removed or an insignificant remnant of tonsillar tissue was left on one or both sides. An analysis of the remaining 9 cases showed poor results in spite of the general anesthesia.

The writer had long felt that the performance of adenoid and tonsil operations upon children without general anesthesia was unnecessarily cruel. Unfortunately this practice was still in use in many clinics and dispensaries in New York City and throughout the country. Aside from the cruelty the figures quoted above were convincing that adenoid and tonsil operations on children without general anesthesia should be discontinued. It was impossible to effect a complete operation without the employment of a general anesthetic. Again the surgeon was far more likely to cause serious traumatism to the throat if he attempted to operate upon a struggling child. Moreover, the child was likely to receive a nervous shock from which he would suffer for a long time. It was to be hoped that all institutions where adenoid and tonsil operations could not be performed in a thoroughly surgical manner with general anesthesia would have the courage to close their doors to these cases until equipped to care for them properly.

Another matter which required correction was the practice of certain hospitals of charging from two to five dollars for a general anesthetic in these operations. While there might be a practical reason for this state of affairs, it was apt to strike the average layman that it placed a premium on suffering, corresponding to the patient's ability or inability to meet the expense. It seemed only fair to demand that public hospitals should either operate upon all cases without anesthesia or all cases with anesthesia, entirely irrespective of the patient's ability to pay.

A circular letter was sent to the different hospitals and dispensaries with the object of ascertaining the length of time that the children were kept in the hospital after operation. Of these, twenty-two replied, the replies indicating that nine lived up to their obligations and kept their patients approximately twenty-four hours or longer for observation and treatment. In four other institutions the children were allowed to go home directly after the operation, while in seven they were kept from one to twenty-four hours, usually from one to three hours. It was only too clear that where these cases were sent home in less than one day there was great danger of post-operative hemorrhage, pneumonia, or other complications.

Dr. Cocks concluded that (1) a greater number of medical inspectors was needed; (2) that school physicians and nurses should exercise more care in seeing that children referred for operation carried out their recommendations; (3) that when children were referred to hospitals or clinics they should be sent to institutions which maintained nose and throat departments, in order to avoid attacking the tonsils when the anterior nares were at fault; (4) that hospital physicians should remember that a child referred from the school physician was often sent simply for diagnosis and treatment, such a card not being an indication that operation was imperative; (5) that all adenoid and tonsil operations on children should be done under general anesthesia; (6) that hospitals doing these operations should be equipped to keep their patients at least twenty-four hours after operation; (7) that a list of hospitals which employed general anesthesia and carried out proper after-treatment for their adenoid and tonsil operations be compiled each year. This list should be given to the school authorities for use in directing pupils unable to pay for private operations. A committee appointed by the Academy of Medicine could be relied upon to draw up such a list on an impartial basis.

DISCUSSION.

Dr. T. Passmore Berens said that the readers of the papers had done a valuable service in bringing this subject to the attention of the profession. The work done by the Department of Health for the benefit of the school children was work that was deserving of praise, encouragement and coöperation on the part of the profession at large. It was astonishing to learn from Dr. Cocks's statistics of the large percentage of children who had been operated upon without the use of an anesthetic. Dr. Berens considered that the practice of operating on children for the removal of tonsils and adenoids without the use of anesthetics was most reprehensible and that it should be severely condemned at every opportunity. The practice was a horrible one; it was brutal and unsurgical, and the results usually were bad. The nervous shock to the child very frequently caused grave sequelæ, for instance, chorea, post-operative neurasthenia, and last, but by no means least, a dread of the doctor. It was astonishing to think that the children were operated upon for the removal of adenoids and tonsils with or without the use of a general anesthetic and then within a few hours were allowed to return to their homes in the care of an untrained attendant. They should not be subjected to the dangers which this pernicious practice entailed.

DR. S. JOSEPHINE BAKER said that she had not been present during the reading of the papers, but she had a general idea of the contents of Dr. Cocks's paper, as she was familiar with his work. She wished to endorse his conclusions in regard to tonsil and adenoid operations without anesthetic. It had been their experience that the children did suffer extremely from the severe nervous shock and that from a surgical point of view the operations performed without an anesthetic were not successful. Often children were referred for operation who had already been operated upon but were not improved by the first operation. The hospitals were not equal to the demands made upon them. Last year there were 30,000 children in the public schools requiring adenoid and tonsil operations and less than 20 per cent. were operated upon. The Department of Health accepted the certificate of any physician in regard to the treatment of enlarged tonsils. The Department of Health conducted five hospitals for the performance of adenoid and tonsil operations. These had been in operation for about eighteen months and about 4,000 children had been operated upon in these hospitals. There had been one fatality. The children were kept in the hospital thirty-six hours from the time of entrance and at least twenty-four hours after operation. Aside from the one fatality they had had no bad or unfavorable results. It is customary in some dispensaries to send the children home immediately after the operation in the care of an untrained attendant, and there were frequently severe secondary hemorrhages, and in one instance which had come to their notice the operation was followed by septic sore throat and death. Dr. Baker expressed the hope that Dr. Cocks's paper would awaken his hearers to the fact that the dispensary was not the place for these operations. It was also to be hoped that the hospital service could be so extended that patients unable to pay could be cared for.

Dr. Alfred F. Hess said that Dr. Fishberg's investigation was of great interest to the community, as it concerned, perhaps, thirty or forty thousand of its children. It seemed that there were three main points raised in the paper: First, that his group of children was under weight; second, that they did not gain normally in weight; and, third, that they reacted in large ratio to tuberculin.

In regard to the question of weight, Dr. Hess asked what standard was selected as normal. Were the weights of the children of this group compared with those of similar children or with the weights of normal children living under proper hygienic conditions? If they were compared with children of the latter class, one would expect the weights to be low; while if the comparison was made with children living in tenement houses there probably would not be so great a difference. If these children were really under weight what was the cause of it? Was it due to their hereditary constitutional weakness, or to their latent tuberculous disease, or to their poor food and unsanitary surroundings? This, of course, was important to consider if one wished to strike at the root of the question and to attempt a solution. It might be said that these children were below par merely because they did not have an average amount of food and did not live in quarters of average healthfulness. For it was known that the tuberculous earned less than average wages and therefore lived under the poorest general conditions of any of the poor in New York City.

Second, as to the tuberculin test—Dr. Fishberg had shown that the majority of these children reacted to tuberculin. In fact, the chart showed that 67 per cent. reacted in the second year. This in itself led to the inference that his reaction did not denote tuberculous disease and that one could not infer from it that the children would die of tuberculosis. Indeed, the question had been, and might well be, raised as to whether this reaction did not confer immunity in later life. In this connection Dr. Hess gave his experience that a small proportion of these reacting children developed tuberculous meningitis.

Third, in regard to the lack of gain in weight—At the tuberculosis preventorium in the course of the past five years about 1,000 children had been harbored for a period of about three months. There was no difficulty in making those children gain, although they were almost all children of tuberculous parents.

About 110 out of 900 gained 10 pounds or over; some gained 15 to 20 pounds, and one gained 28 pounds. There had been no greater difficulty in making these children gain than in effecting a gain in the ordinary child; so that in this regard the speaker said that he could not agree with the essayist.

Dr. Godfrey R. Pisek said that they should keep in mind the fact that while Dr. Fishberg had done a large and commendable work, it was, after all, among a special group of people. They were dependents, they were of one race, and they lived in the tenements. These factors had to be taken into consideration when studying the statistics. It was to be regretted that such work had not been done in other localities, for they were certainly in need of just such statistics. It was to be regretted that Dr. Fishberg had not told them more of his ideas regarding the mode of infection. He had stated that the majority of these children were breast-fed and that during the first year they resisted infection, while during the second and third years the number of infections mounted up rapidly. Was the infection enterogenous or aerogenous? In considering these families it should be borne in mind that when the father was tuberculous the mother became the bread-winner, while the children were left to the care of the father in the home and were thus in close contact with the source of infection. In this respect the children of this group differed from the general type of child. The percentage of infections in Germany was given as 80 per cent. of those exposed; he had always believed that this percentage and those for European countries were greater than those for this country and was glad to learn the statistics. Dr. Fishberg had not said much about the physical signs; it would be interesting to know what type of physical signs these children mainly presented. Such physical examinations should be made and a report presented. The theory was confirmed that adult tuberculosis was latent tuberculosis in the child, and while they did not see the signs in the prenatal state and during infancy they saw them in what might be termed the paratuberculous conditions of later life. A lowered resistance predisposed to those paratuberculous conditions was certainly the result of living in a tuberculous environment.

Dr. R. Ottolengui said that, being a dentist, practicing more particularly orthodontia, he scarcely felt that he fitted into the discussion, but he had been asked to discuss Dr. Cocks's paper and supposed that he was to tell them that many of the claims of the orthodontist were exaggerated. They had just heard that the Department of Health was finding that the results of adenoid and tonsil operations were not always satisfactory; the orthodontist was observing the same thing. The time was when the orthodontist asked the parent if the child had been examined for adenoids, but now he asked whether the child had had his adenoids removed, and the answer frequently was, "Yes, two or three times." Dr. Cocks had mentioned mouth-breathing and the high vault. What does the high vault mean? Does it mean a vault high from the floor of the mouth, or one high in proportion to the width of the arch? The vault might be really high or only seemingly so because of a narrow arch. The statement had been made by some dentists that they lowered the vault by pulling the vomer down. This was an error; the dentist's intentions were good, but he was mistaken. There was nothing in the apparatus used that could lower the vault. Another claim was sometimes made that more breathing space could be given by opening the median suture. He had led the profession astray on this point a few years ago, but he had discovered his mistake and was willing to acknowledge it. Often the suture between the premaxillary bones was open before they started to perform the operation. A study of this operation by means of the X-ray showed that there was no evidence that they succeeded in opening the median suture. This was not a suture of one bone on another, but an absolutely symmetrical suture with the outer plate of the vomer attached for nearly its entire length. Separating the suture would break the attached bones.

Dr. John E. MacKenty said that he did not know that conditions were as bad as had been stated in tonsil cases, but he had noticed that there were many cases which had to be operated on a second time. Children should be examined for nasal obstruction and should be sent to such hospitals as were properly equipped not only to perform the tonsil operations, but to care for nasal abnormalities. In children who had suffered from enlarged tonsils and adenoids for a long period there was apt to be hypertrophy of the inferior turbinates. This had been recognized in the clinics abroad and they now made it a routine practice to remove a small portion of the inferior turbinates when operating on the tonsils in cases where a permanent enlargement of the inferior turbinates was found. One cause of mouth-breathing and of lack of good results was faulty occlusion. The speaker said he was thoroughly in accord with the work of the orthodontists in their endeavor to correct this defect. Again, it often happened that after an operation a child continued to be a mouth-breather because he had never been taught to breathe properly; proper breathing would some day be taught in the clinics and the science of breathing should be given a place in their therapeutics. The speaker said that he encountered some bad work sent to his clinic at the Manhattan; in some instances one-half the tonsil remained and the cut surface became cicatricized and obstructed drainage, with the result that the condition was worse than before operation. One met with a variety of mutilations as the result of faulty operations. The modern tonsil operation was quite different from the operation formerly done, even by the specialists. The modern operation was a major operation and should be in the hands of an expert.

As to the care of these children, where should the absolutely charity case receive proper and humane treatment? The city hospitals had only forty beds for such cases. The overflow must come to hospitals maintained by private donations and there receive proper and humane treatment, or else go to be tortured by free etherless operations in one of the many dispensaries and immediately be sent home, perhaps to bleed to death. Why did not the city pay the cost of a properly done operation at a properly equipped hospital? Was it not too much to expect such hospitals, all facing a yearly deficit, to disburse at least two dollars on each charity case taken care of? The city should either extend its own facilities or extend financial justice to those who were endeavoring to do this work in a humane and proper way.

Dr. John Winters Brannan said that he had been interested in all the papers, but especially in what Dr. Cocks had said in regard to anesthesia in tonsil and adenoid operations. Some six or seven years ago he had seen these operations performed without an anesthetic at Gouverneur Hospital and had been struck by their cruelty, and shortly afterward an order was made by the trustees forbidding these operations without an anesthetic in any of the hospitals of the department. At first all he had thought of was the pain, but in discussing the subject with laryngologists connected with the special hospitals he learned that they had taken similar action years before, not simply to save giving pain, but because the operation could not be properly performed without an anesthetic. Last week he had heard that there were still two places in the city where the operation was done without an anesthetic—the one was a dispensary; the other, one of the hospitals under his charge, where a surgeon was said to have operated three times recently without an anesthetic. On being questioned he replied that he felt justified in his action, as he could do the operation in sixteen seconds; all he seemed to think of was speed. A few days later, after reflection, he said that he had only removed the adenoids, not the tonsils. The speaker said that he had recently been told that opinion was again changing and that there were now some authorities who believed that the operation could be done without a general anesthetic, so that he was very glad to hear what had been said this evening and hoped that it would stiffen the backs of the trustees of hospitals to insist upon the right course. The organization called the Associated Out-Patient Clinics, composed of representatives of all the dispensaries in the city, recommended last year that these operations should not be performed in dispensaries, but only in institutions having hospital facilities.

Dr. Maurice Fishberg, in closing the discussion, said that Dr. Hess had asked a very proper question. One must be careful when he made a comparison of this kind; the race factor must always be considered. In his study he had compared the children in the tuberculous milieu with those of the same race stock measured in the public schools in the same neighborhood. To the second question as to whether children who made an active response to the tuberculin test were in danger of their lives, he wished to say that infection might be massive or mild. The child with the mild infection might become immune to the disease and not only did not succumb to it, but might be proof against reinfection. Those who received a massive infection during the first and second year had probably succumbed, and those who survived might carry a latent lesion which might flare up at puberty.

Dr. L. E. La Fétra said he wished to ask Dr. Cocks one question. When he spoke of operations without a general anesthetic on adenoids and tonsils did he mean that adenoids alone should not be operated upon without a general anesthetic? He asked this question because there were some cases where an operation for adenoids was required, but a tonsil operation was unnecessary.

DR. GERHARD H. COCKS replied that he considered it necessary to use a general anesthetic in the removal of adenoids if one expected to do a complete operation.

At the election of officers held after the scientific session, Dr. William P. Northrup was elected chairman and Dr. Royal Storrs Haynes secretary of the Section for the ensuing year.

ARRHYTHMIA IN HEALTHY CHILDREN.—Ragnar Friberger (*Jahrb. f. Kinderhk.*, 1912) gives his observations on irregularities of the heart in healthy children. He believes that a considerable amount of irregularity is consistent with perfect health in children. His observations included examinations of 321 children, aged five to fourteen years, of whom 64 were re-examined later. The children were measured and weighed, and their blood pressure was taken. Also tests were made for albumin, and heart and lungs were carefully examined. Not one of the 321 had an absolutely regular pulse. There were differences in the length of the beats and the height of the curve. There was a moderately regular pulse in 37.4 per cent., a very irregular pulse in 12.2 per cent., and a moderately irregular pulse in 50.4 per cent. In most of the cases there was an alternation of long and short pulse. In others the pulse was suddenly retarded at regular intervals. In others after a series of short pulses a succession of pulse beats of double the length occurred. There is an evident relation of this arrhythmia with the variations of respiration seen in children. It may be laid down as a rule that children otherwise healthy and having normal respiration and digestion have no heart lesion even when irregularity is observed in the pulse. There is another category of nervous children in which psychical disturbances account for irregularity of the pulse. It occurs also in children convalescent from infectious diseases or other severe illnesses, due to true heart weakness. The author concludes that heart irregularities are physiologic in children from five to fourteen years of age. The cause of these irregularities is unknown.

CURRENT LITERATURE.

Abstracts in this Number by

Dr. Charles E. Farr. Dr. S. W. Thurber.
Dr. Harold R. Mixsell. Dr. Jerome S. Leopold.

DISEASES OF THE EAR, NOSE AND THROAT.

Spencer, Frank R.: Diseases of the Labyrinth, with a Report of 19 Cases. (*Annals of Otology, Rhinology and Laryngology,* September, 1913, p. 581.)

After reviewing briefly the physiology of the semi-circular canals and the tests for their function, the author cites his cases, among which are the following in children which show invasion of the labyrinth:—

Case 10. A boy of six, who had had an otitis media purulentia for eight months. Three weeks after the onset he developed sepsis, nystagmus, vertigo, deafness and loss of vestibular reaction. His temperature at this time was 102°F. The diagnosis was acute serous labyrinthitis, as there were no signs of meningitis, which he would have if the process were purulent. His further history is not cited.

Case 12. A boy of six years, with a history of acute purulent otitis media in the left ear and of chronic purulent otitis media in the right. His head was inclined to the right and the right side of his neck was stiff. Hearing on the left side very good, but very poor on the right. He had been vomiting that day and was very dizzy. His torticollis may have been due to either meningitis, cerebellar abscess, temperosphenoidal abscess, sinus thrombosis, peri-sinus abscess, mastoiditis, meningismus of endocarditis. Operation revealed a thrombus in a tributary of the jugular, part of which was excised. He is deaf in the right from destruction of the inner ear by a severe serous labyrinthitis. The recovery from the operation was prompt and uneventful.

S. W. Thurber.

Shambaugh, George E.: The Faucial Tonsils as a Focus for Systemic Infection. (*Annals of Otology, Rhinology and Laryngology,* September, 1913, p. 659.)

The general belief that the tonsil is the focus of infection in rheumatism, arthritis, neuritis, cardiovascular degeneration and nephritis in their chronic forms and why not in their acute manifestations, is now well established. The author believes that the general practitioner as well as the specialist has not fully appreciated the relations between infections of the faucial tonsils and certain systemic conditions. The improved condition of children after removal of tonsils is not alone due to better air space, but also to the removal of a constant, even though it be a slight, source of systemic infection. The tonsil which is subject to repeated attacks of infection is the dangerous one, whether it be large or small. However, the large tonsil is one which is frequently badly drained and from which secretion can often be expressed, which secretion remains stagnant in the tonsil on account of its size and the depth and narrowness of its crypts. The tonsil hidden behind folds or adhesions of the anterior faucial pillar is also a dangerous one.

The treatment of tonsils suspected of harboring infectious foci consists, as would the treatment in any other portion of the body, of the removal of these foci. As far as the faucial tonsil is concerned, the author believes that enucleation is the one thorough method of operation. In children always use general anesthesia. S. W. THURBER.

SURGERY.

SHARPE, W., AND FARRELL, W. P.: A NEW OPERATIVE TREATMENT FOR SPASTIC PARALYSIS. (*Journal of American Medical Association,* November 29, 1913, p. 1,983.)

Sharpe and Farrell have determined that in a certain number of cases of spastic paralysis a large part of the symptoms is due to increased intracranial pressure, as determined by the ophthalmoscope. This is especially true of the cases of spastic paralysis of the hemiplegic and paraplegic type due to birth trauma. The very mild cases and those not accompanied by mental impairment do not require the major procedure, but can be relieved by the simpler measures of tendon lengthening, etc. On the other hand, the cases of agenesis and maldevelopment of the cortex do not lend themselves to any form of surgical treatment. The authors report 2 cases in detail, showing marked improvement after a subtemporal decompression operation. The improvement in the mental condition was very marked and was especially gratifying in that it allowed of coöperation on the part of the patients and therefore much more rapid progress. They have operated on 12 cases in all, of the extreme type, and have had uniformly good results. The operation is not a difficult one for a trained surgeon. There were no deaths. CHARLES E. FARR.

NUTT, J. J.: RESULTS OF BONE PLASTIC AND GRAFT OPERATIONS ON THE SPINE FOR THE CURE OF POTT'S DISEASE. (*Journal of American Medical Association,* November 15, 1913, p. 1,780.)

Nutt gives the details of 15 cases of spinal tuberculosis treated at the Sea Breeze Hospital either by the plastic method of Hibbs or by the bone transplant of Albee. X-rays and tracings were shown and the results would seem to warrant the utmost conservatism in the use of the operations. He concludes as follows: "(1) While I do not unqualifiedly condemn the operation on account of the poor results in some of these cases, I do not believe the claims which have been made for it have been substantiated. (2) If alterations in technic, such as the implantation of a longer graft, and the extension of the period of post-operative use of external support, are to improve the results, then reports should be forthcoming two years after the operation and not before. (3) The danger in the use of the operation does not lie in the operation itself, but in the creation of a false security, a feeling that a cure of a chronic disease has been produced, and a consequent neglect of other therapeutic measures." CHARLES E. FARR.

MEDICINE.

IWAMURA, K.: OBSERVATIONS OF SPASMOPHILIA IN JAPAN. (*Zeits. für Kinderhk.,* November 15, 1913, p. 147.)

Iwamura calls attention to the fact that very few cases of spasmophilia have been reported from Japan. To determine whether there really was much spasmophilia in Japan the author tested the electrical reactions on about 100 cases whose ages varied from three months to three years. In no case was there a positive electrical reaction. As is well known, the electrical reaction is the most delicate test there is to determine the presence of spasmophilia.

Iwamura concludes that there is practically no spasmophilia in Japan because the infants are mostly breast-fed and consequently there is very little rachitis in Japan. There is no question that where there are cases of rachitis there one will always find cases of spasmophilia, and where rachitis is absent spasmophilia will rarely, if ever, appear. JEROME S. LEOPOLD.

ZUNDEL, C. E.: INFANTILISM. (*The Practitioner,* November, 1913.)

Zundel classifies the causes of infantilism according to the present knowledge of its etiology as follows:—

(1) General diseases, *i.e.,* tuberculosis, syphilis.

(2) Malnutrition, *i.e.,* morbus cordis, biliary cirrhosis, gastrointestinal diseases, renal disease and absorption of such poisons as lead, mercury or nicotine.

(3) Diseases of the internal secreting glands.

After running over the causes mentioned under general disease and malnutrition, and emphasizing the very common rôle played by thyroid insufficiency, he dilates at length on the pituitary function and its relation to infantilism. In clinically recognizing hypopituitism the following points are to be observed: When the posterior lobe is absent there is a great tolerance for sugar; glycosuria sometimes not following the ingestion of more than three times the amount (100 grams), which will cause glycosuria in a normal individual. Secondly, in total absence of the gland an injection of the anterior lobe extract produces a transient rise in temperature comparable to the tuberculin reaction. Lastly the administration of the extract can be used diagnostically to demonstrate a hypo-condition.

The prognosis of hypopituitism depends on the underlying condition, being more encouraging in the glandular group. When unable to determine which ductless gland secretion is absent, thyroid extract will sometimes give good results, owing to the interdependence of the ductless glands. For hypopituitism use whole gland extracts and gauge the dosage by watching the carbohydrate tolerance. When this is normal the dosage is adequate.

HAROLD R. MIXSELL.

RIESMAN, DAVID: A LOBAR FORM OF BRONCHOPNEUMONIA OF LONG DURATION, OCCURRING IN CHILDREN AND YOUNG ADULTS. (*The American Journal of the Medical Sciences,* September, 1913.)

Seven typical cases, all unilateral, are cited by Riesman. They are characterized by impairment of the percussion note, bronchovesicular breathing, crackling râles, low fever, rarely above 101°; cough, which at times scarcely attracts attention; and a long duration of several weeks to three or four months. The author is of the opinion that the disease is a confluent lobular pneumonia of lobar distribution, and that it must be looked upon as one of the causes of obscure, long-continued fever. It always seems to end in complete recovery, both symptomatically and anatomically. Typhoid fever at first may be suspected, and in the later stages tuberculosis.

The disease is often overlooked, due to the fact that the lower posterior chest is seldom examined in ambulatory cases, especially when the symptoms are rather trivial. The treatment which seems to be of some avail consists of counter-irritation, abundant feeding, good hygiene, and either a simple cough mixture with a small dose of an opiate, or one of the creosote preparations.

HAROLD R. MIXSELL.

INFANT FEEDING.

GOETT, T. A.: A CASE OF MALNUTRITION DUE TO AN EXCLUSIVE MILK DIET IN A BOY OF THIRTEEN YEARS. (*Zeits. für Kinderhk.*, December 13, 1913, p. 457.)

Goett, writing from Pfaundler's clinic in Munich, reports a very interesting case in a boy of twelve and one-half years of age who during his whole lifetime had absolutely refused all food excepting milk and milk foods. And the food had always been taken through a nipple. All solids had been refused. Milk would not be taken unless it was given through a nipple. Time and time again other food had been tried, but it was always refused, or vomited directly after ingestion. During a period of two weeks no milk had been given, and during this time the boy refused all other food.

On admission to the hospital the boy was thirteen years of age and weighed 27 kilograms, 9 kilograms less than a normal child of his age, and showed a very marked anemia.

In the hospital solid food was very gradually added to the milk, and, although this was at first vomited, it was later on retained. The nipple was also taken away from the patient, and he was fed with a spoon. After two weeks' stay in the hospital the patient was able to swallow a little chopped meat for the first time in his life. The patient was then discharged from the hospital. Eight weeks later the father reported that the patient was able to eat almost everything that was given him, although he ate meat very slowly. JEROME S. LEOPOLD.

BOOK REVIEW

SURGICAL DISEASES OF CHILDREN: A MODERN TREATISE ON PEDIATRIC SURGERY. By SAMUEL W. KELLEY, M.D., LL.D., Honorary Professor of Surgical Diseases of Children, Medical Department, National University, St. Louis; Pediatrist and Orthopedist, St. Luke's Hospital, Cleveland; Formerly Professor of Diseases of Children, Cleveland College of Physicians and Surgeons, Ohio Wesleyan University. Second edition, thoroughly revised and enlarged. Over 300 illustrations and plates. Pp. 789. New York: E. B. Treat & Co.

The second edition of Dr. Kelley's book deserves the approval of the profession. Some subjects have been rewritten and new matter and illustrations have been added, but owing to condensations the work is but little larger than the first edition. Practically the entire field of pediatric surgery has been covered. There are chapters on laryngology and otology, but ophthalmology has not been considered.

Throughout the book one is impressed with the commendable conservatism of the author. Statistical arguments and unnecessary discussion of unsettled subjects have been avoided. On the whole, there is much to praise and little to criticise.

The chapter on abdominal diseases is excellent, but one is disappointed to find castor oil, calomel and salines recommended for the relief of vomiting and pain in the acute stage of appendicitis. Another disappointment is the attitude of the author with regard to the treatment of intussusception. He still favors aero-hydrostatic measures as "perfectly efficient in the great majority of cases," and "in the few cases in which these fail, early resort to laparotomy." The majority of cases of intussusception cannot be treated successfully by hydrostatic pressure or air insufflation, and if such teaching be allowed to go unchallenged the mortality in this affection will continue to be disgracefully high, "early resort to laparotomy" being denied the surgeon. The essential facts of pediatric surgery, however, have been presented in clear and interesting manner, and the work will prove of value both to the surgeon and the general practitioner.

ARCHIVES OF PEDIATRICS

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THOMAS MORGAN ROTCH.

In the death of Dr. Thomas Morgan Rotch the pediatrists of America have suffered a great loss; to many of them his death comes as a personal bereavement. He was one of the small group of pioneer workers in this branch of medicine, of whom now but few remain. Both as a teacher and a writer he has had a wide influence upon his profession. His death occurred after a brief illness at his home, on Commonwealth Avenue, a house which has been the hospitable Boston headquarters of pediatrists for a generation.

Dr. Rotch was born in Philadelphia in 1849; received his academic degree at Harvard in 1870, and his medical degree from the same institution in 1874. After graduation he served as house officer in the Massachusetts General Hospital. In 1875-76 he studied abroad in Germany, Paris and London.

He was one of the first, if not the very first, physician in Boston to devote himself exclusively to pediatrics. When a department in this branch was established in Harvard University in 1888 he was appointed to head it with the rank of assistant professor. Under his direction, and owing to his energy, this department soon became an important and influential one. In recognition of which, in the year 1893, he was given the rank of a full professor in the medical school. Harvard was the first institution in this country to recognize pediatrics as an independent department.

Dr. Rotch displayed marked ability as an organizer; in fact, as an executive he had few superiors in his profession. He drew around him a group of earnest young men, who caught his enthusiasm and, under his guiding hand, the Department of Pediatrics at Harvard became justly celebrated. He had much to do with the development and administration of the Children's Hospital, while the Infants' Hospital was almost entirely due to his efforts and energy. For years he was the head and front of nearly every movement in Boston for infant welfare. As a teacher he was forceful and always inspiring to his students.

Dr. Rotch's most important early contribution to medicine was a noteworthy one on the subject of pericarditis, but he will always be best known for his contributions to the subject of infant feeding. When he began to study and write upon this subject, our knowledge and practice were in a chaotic state, and, while there are many who have not accepted some of his views, the credit must surely be given to him for the earliest exact work on feeding which was done in this country. His work was a great stimulus to other investigators. It has had a wide influence and will always have a deep significance.

His text-book on "Pediatrics," which appeared in 1895, at once commanded a wide reading both in this country and abroad, and took its place among the standard works upon this subject. It has since passed through five editions. During recent years the subject of radiography in children has engrossed much of his attention, and his volume, "The Roentgen Ray in Pediatrics," which appeared in 1910, was another monumental work. His miscellaneous contributions to pediatrics covered a wide range

Courtesy J. B. Lippincott Co.

Thos. Morgan Rotch

of subjects, but the field of nutrition always claimed his largest interest and attention.

Dr. Rotch was one of the founders of the American Pediatric Society, and was its second president in 1891. He was a constant attendant and a regular contributor to its meetings. At the time of his death he was a member of the Association of American Physicians, the American Medical Association, the New England Pediatric Society, the Suffolk District Medical Society, the Association for the Advancement of Science and many other scientific, social and charitable organizations.

While this is not the place to touch upon the more personal side of his life, one cannot refrain from paying tribute to his high character, his generous nature and his striking personality. Dr. Rotch was a man of strong convictions; never lukewarm upon any subject. Generous almost to a fault, he was a true friend whom multitudes will remember through their lives. His finest qualities were shown in nothing so well as in the way in which he bore the troubles and bereavement of his later years. The loss in 1902 of his only son, just graduated from Harvard, was a blow from which he never fully recovered.

The new Infants' Hospital was largely erected by friends as a memorial to his son. It had been his dream to see this completed and occupied before his retirement from active service at Harvard. He had often expressed to his friends the hope that he might be permitted to deliver the first lecture in the new building; but his summons came unexpectedly before the hospital was quite finished and before the age limit of retirement was reached.

The severe strain imposed by the hopeless illness of his wife for the last four years was more than even his strong constitution could bear. In spite of gradually failing strength he continued to do his regular work until about the middle of February, when his first acute breakdown occurred; but after a few days' rest he was up and at his work again. On the twenty-fourth of February he was suddenly taken worse, but not considered critically ill until the twenty-eighth, when he suffered a sudden collapse. From that time until the end, which occurred on the ninth of March, his condition was considered hopeless. The direct cause of his death was dilatation of the heart, an old valvular disease and a recent pneumonia.

L. EMMETT HOLT.

ORIGINAL COMMUNICATIONS

THE INFANTS' MILK STATIONS: THEIR RELATION TO THE PEDIATRIC CLINICS AND TO THE PRIVATE PHYSICIAN.*

BY S. JOSEPHINE BAKER, M.D.,
Director, Bureau of Child Hygiene, Department of Health, New York City.

In 1908 the Bureau of Child Hygiene of the Department of Health was organized for the purpose of pursuing a progressive and constructive policy with relation to the health of the children of the city. Its activities include practically all features of child welfare work in relation to health, but one of the most important of its functions has been, and is, the attempt to reduce infant mortality.

In 1907 the death rate from all causes of children under one year of age in relation to each 1,000 births was 144. During the four years previous there had been but a slight fluctuation in the rate. In 1906 it was 153 per 1,000, while in 1903 it was 153. It was felt that the former methods of dealing with this problem must be discarded and that a campaign of educational prevention must be instituted in order that there might be a definite imprint made upon this excessive mortality rate.

No particular funds were provided for this work, so that during 1909 and 1910 it was possible to carry it on only during the summer months, using the force of school inspectors and nurses for this purpose, yet the change from the purely corrective work of the past, which had consisted in visiting families to see if sick babies could be found and then offering treatment, to the present policy of sending nurses to visit babies as soon as possible after they are born and instructing the mothers in the methods whereby the babies may be kept well, were so marked that in the first year—1908—the death rate was reduced to 128 per 1,000, the numerical decrease being 1,206 deaths. The following year practically the same policy was carried on, but the death rate was not further reduced. It was felt that a year-round campaign must be instituted if true preventive work was to be done. Accordingly, an appeal was made to the Board of

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* Read before the Section on Pediatrics of the New York Academy of Medicine, January 8, 1914.

Estimate and the budget appropriation for the Department of Health for 1911 allowed for the establishment of fifteen infants' milk stations to be maintained under the control of the Bureau of Child Hygiene.

The City of New York has ample facilities for caring for sick babies. Until the establishment of the infants' milk stations there were practically no facilities for providing proper instruction in "how to keep the babies well." It was obvious, however, from the facts that I have already recorded, that treatment of sick babies has little appreciable effect upon the reduction of the infant death rate. The necessity of the city undertaking this work was clearly indicated by the fact that, with the exception of the efforts of a few philanthropic agencies, no systematic effort had been made for any definite work for the reduction of the infant death rate. The fifteen Infants' Milk Stations instituted in 1911 were supplemented by thirty-one of the New York Milk Committee, eleven of the Brooklyn Children's Aid Society, eight of the New York Diet Kitchen Association, nine of the Nathan Straus, four of the Babies' Dairies and two stations in settlements or clinics.

An Association of Infants' Milk Stations was formed in order that the records might be uniform in all instances and that the city might be districted to avoid overlapping of work or encroachment upon one another's territory. The year showed a death rate of 112 as compared with 125 in 1910, or an actual numerical decrease of 1,162 deaths, which clearly demonstrated the value of this systematic coöperative work. The New York Milk Committee and the Brooklyn Children's Aid Society, feeling that the responsibility for the reduction of infant mortality should be assumed by the municipal authorities, wished to withdraw from the field, and, as a result of the proved efficiency of this type of work, the Board of Estimate and Apportionment granted to the Department of Health an increased appropriation for 1912 sufficient to establish forty additional milk stations, making fifty-five in all under the control of the Bureau of Child Hygiene. This number remains the same at the present time.

The infants' milk stations are not children's clinics. Their purpose is to provide instruction in the proper hygiene and feeding of infants. One of their most important achievements has been the encouragement of breast feeding. The stations were all located after careful preliminary surveys had been made in those sections of the city where the birth rate and the infant death rate were the highest and where no previous facilities for combating this death rate had been established.

Eighteen medical inspectors were assigned to duty in this work, each inspector having charge of three stations and spending two mornings each week at each station. During the summer, when the registration at the stations is largely increased, enough additional inspectors are assigned to duty so that each station has a doctor in attendance each morning. Each station is in immediate charge of a trained nurse, who has an assistant. In addition, there is an employee who sells the milk. City employees are not allowed to sell any article, consequently arrangements for the control of the milk supply were made by drawing up specifications of the character of the milk required and by asking for bids for the sale and distribution of such milk in the stations of the department. The milk now sold is "Grade A Pasteurized." For this the milk company charges eight cents a quart, a much lower rate than the regular market price. It is dispensed in one quart bottles only, and is subject to constant analysis and inspection by the department in order to see that the standard is maintained.

Mothers and babies are received at the station by the nurse. If the doctor is not present, the nurse takes a brief history of the case and, if any instruction as to feeding seems essential, gives the mother the directions according to a prearranged outline of simple milk dilutions suited to certain ages. The mother is then instructed to return on the first day on which the doctor will be present. At that time the baby is thoroughly examined by the doctor and, if artificial feeding is necessary, an individual formula is prescribed for each case. One copy of this formula is given to the mother and the other to the nurse. The nurse instructs the mother both at the station and at her home in the preparation of this formula and also makes all the necessary home visits to see that the doctor's instructions relative to hygiene of infancy and method of feeding are carried out. The formulæ of milk dilutions which are used by the nurse simply as temporary expedients are printed on small slips with simple directions. These dilutions were devised, at my request, by a committee of which Dr. William P. Northrup was chairman.

The physicians assigned to duty in these stations are competent, thoroughly trained men and women. In addition to the regular staff there are three supervising inspectors, three supervising nurses and a chief inspector. Particular care is taken in the assignment of physicians to this service, and only those are selected who have demonstrated their fitness in the specialized work of infant hygiene and feeding.

Sick babies are not treated at these stations unless the illness is caused by an error in diet and is amenable to dietetic treatment. Even in such cases treatment is not given unless the family are unable to employ a private physician and refuse to go to a dispensary or hospital. All other sick cases are referred immediately to a private physician of their own selection, or, if unable to pay for treatment, to the most accessible dispensary or hospital. With each baby is sent a reference slip, giving the name and address of the child and the formula which is being used in feeding. Requests have been made of all the dispensaries and hospitals to send a similar reference slip to the milk station after the baby has left the care of the institution. All of the children's clinics and hospitals for infants have been supplied with these reference slips by the Babies' Welfare Association, but so far few dispensaries or hospitals have coöperated in this manner. It is evident that such data is of immense importance, as when the baby is transferred from the milk station to the hospital or in the reverse order, if the feeding formula is not known, much valuable time is wasted in the attempt to ascertain the best type of feeding for the child. The department, therefore, strongly urges that the pediatric clinics and babies' hospitals make use of this reference slip.

When babies are once registered at the milk stations they are kept under continuous observation. Whenever a child is sent to a dispensary or clinic its record is carefully followed, and in such instances, if death occurs, either under the care of a private physician, a pediatric clinic or in a hospital, the death is charged against the record of the milk station.

The milk stations welcome the coöperation of private physicians, and many of the latter have taken advantage of this and send babies to the milk stations for milk and for instruction of the mothers as to how the formula should be prepared. Whenever a private physician sends a prescription for the feeding formula and states that the baby is under his care, the doctor at the milk station does not see the child. In every such instance the nurse receives the mother, notes the formula provided by the private physician and instructs the mother in the methods by which this formula may be prepared. The doctor's suggestions in this regard are scrupulously carried out and under no circumstances does the milk station inspector either examine or treat the baby or instruct the mother. Any infraction of this rule is dealt with summarily. Likewise, under no circumstances is any employee of the Department of Health allowed to take as a private patient any person with whom he comes in contact in his official capacity. Any violation of this rule would render the physician liable to dismissal from the department.

Every effort is made to ascertain whether or not the women attending the Infants' Milk Stations are able to pay private physicians. Investigation for this purpose is made at the home by the milk station nurse.

The milk stations are prophylactic centers; their object is the reduction of infant mortality and the encouragement of breast feeding by instruction of the mother in all methods of baby care, and, when necessary, the provision of a proper food. Every case is observed closely in its home surroundings and instruction given in regard to sanitation and hygiene in the home and the clothing, bathing and other features of baby care.

During the year 1913 a total of 49,904 babies were cared for at these stations, 9,294 of this number being carried over from the previous year; 2,367,495 quarts of milk were dispensed, and the nurses, with their assistants, made 262,121 visits to homes. During this period 145 deaths occurred among the milk station babies, or three-tenths of 1 per cent. of those enrolled. Of these deaths, 97 were due to diarrheal diseases and 48 to other causes.

During 1912 the infant death rate was 105 per 1,000 births and during the past year—1913—this has been still further reduced to 102 per 1,000. The reduction of infant mortality in New York City during the past ten years has been greater than that achieved by any other large city in the country. With the exception of Rochester, the infant death rate in New York City is lower than that of any first or second class city in New York State, and lower than the average infant death rate in all the third class cities of the State. During the past year—1913—there were 510 fewer deaths under one year than there were during 1912. It is interesting to note this actual decrease in the number of deaths of infants because the total number of deaths in the city from all causes at all ages during the past year was 894 more than for 1912. That the Infants' Milk Stations have been the largest single factor in this remarkable result there can be no doubt. They have justified their existence as an important part of the propaganda for educational prevention of diseases of infancy.

The Babies' Welfare Association is a federation of about eighty agencies in this city interested in baby welfare work. It has a sub-committee on hospitals, and affiliated with this sub-committee are practically all of the representative babies' hospitals of the city. The main object of this association is to promote coöperation. The Department of Health, through the Bureau of Child Hygiene, believes that only through perfect coöperation and thorough understanding of its methods can the best results be ultimately achieved. It is its earnest desire to coöperate to the fullest extent with the private physicians, pediatric clinics and babies' hospitals. It is also its earnest desire that there should be similar coöperation on the part of the latter. It has, therefore, given me a great deal of pleasure to present this paper to you to-night as a subject for discussion and to welcome your interest and your constructive criticism.

MELENA NEONATORUM CURED BY INJECTION OF DEFIBRINATED HUMAN BLOOD.—Albert Merckens (*Münch. med. Woch.*, May 6, 1913) has made use successfully of the injection of defibrinated human blood in a case of melena neonatorum. The mortality of this disease, as stated by the older authors, was 50 to 80 per cent. Now, in spite of the use of gelatin, it is 44 per cent. The blood is defibrinated by whipping for fifteen minutes, and twenty to thirty minutes later it is injected. In melena neonatorum the fibrinogen in the blood is normal. The blood of healthy men contains thrombin, which is brought into the blood of the infant and brings about clotting. The defibrinated blood was injected by the author intramuscularly, and was taken from the arm of a healthy adult. Twelve cubic centimeters were injected into the gluteal region of the sick child. The infant, which had had bleeding from the mucous membranes and the intestines, recovered rapidly and entirely. The hemoglobin content of the blood was increased after the treatment.—*American Journal of Obstetrics.*

AN EXPERIMENT IN THE COLLECTION OF HUMAN MILK FOR HOSPITAL AND DISPENSARY USES.*

BY B. RAYMOND HOOBLER, A.M., M.D.,
New York City.

The experiment which I am about to recite was planned and carried out to answer the following questions:—

(1) Will mothers sell their surplus milk?

(2) Can such milk be purchased without injury to the infant on the breast?

(3) What price would have to be paid for the milk in order to secure it?

(4) How much extra machinery would have to be set in motion in order to collect it?

Such questions were not asked from idle curiosity, but from a sincere desire to increase the supply of human milk available for feeding the sick children in the wards and dispensary of Bellevue Hospital.

It is the experience in every children's Hospital that babies do very much better if they can be fed either wholly or in part on human milk. Langstein and Hoerder in December, 1912, reported the result of feeding infants with marasmus on a mixture of human and cow's milk. All of their cases were in the stage of Finkelstein's decomposition. The infants received from one to three feedings of mother's milk daily, the other feedings being of suitable dilutions of cow's milk. They report that 41 per cent. began to thrive at once, that 18 per cent. slowly improved, that 26 per cent. did not improve and that 15 per cent. died.

The amount of human milk fed is usually limited by the number of wet nurses available. We are allowed three wet nurses at Bellevue Hospital. The problem of securing these wet nurses, who are required to reside in the hospital, is a difficult one, and very often we are able to secure but one or two, seldom three. The usual objection of these mothers was that they had family cares and could not live in the hospital. It was this fact that suggested the experiment.

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* Read before the New York Academy of Medicine, Section on Pediatrics, January 8, 1914.

The Social Service Department undertook to carry out the experiment, and it is to their untiring energy and enthusiasm that we were able to arrive at our conclusions.

After many and varied experiences the following methods have been adopted:—

The Social Service Department is called upon to help some nursing mother. Inquiry is made as to the amount of milk she produces and if there is an excess she is asked whether or not she would care to sell such excess for use of sick babies. If she consents she is examined physically, and a Wassermann reaction is done. She is then sent to the hospital ward, where she is instructed how to remove her milk with a breast pump, usually by one of the trained nurses in charge of the children's ward. Her milk is carefully measured and credited to her. If she has a large excess she comes twice a day; if a small amount, she comes only once a day. After the first visit the pumping is done by the mother herself under the supervision of one of the wet nurses employed in the hospital. The milk is carefully measured and the mothers are instructed in matters of diet and hygiene as they relate themselves to maternal nursing.

The milk of the various mothers and of the wet nurses employed in the hospital is mixed together and bottled and fed to such children as require it, particularly to premature infants, and to those children who are not doing well on cow's milk mixtures.

To make certain that the mother is not depriving her own child of its proper nourishment, she is required to bring the child to the dispensary for inspection and weighing. It has been our invariable experience that the children of these mothers gain steadily in weight and the instruction the mothers receive enables them to give their babies the best of care, much better than were they not constantly under the supervision of the Social Service Department.

During the first part of the experiment various methods of paying the mothers were tried, and the collection of the first 1,750 ounces cost, including everything, at rate of 10 cents per ounce. During the month of December there were collected 1,054 ounces at a cost of 5 cents per ounce. Each mother is paid 50 cents for each visit to the hospital. The average amount of milk given at each visit is 10 ounces. This money is paid to mothers, who, as a rule, would have to receive help from some organization, so that a double charity is performed—a deserving mother is helped and a sick child in the hospital is fed to the best advantage.

The results of this experiment may be summed up as follows:—

(1) We have shown that mothers are perfectly willing to sell their milk.

(2) That certain mothers can spare a portion of their milk without detriment to their own child.

(3) That human milk can be purchased at a reasonable price.

(4) That its collection can be accomplished without additional machinery than may be found in connection with any well-organized Social Service Department.

(5) If needy mothers are chosen to furnish the milk a double charity is performed, viz., a struggling mother is helped to support herself and child, and sick babies are furnished with the best food known.

POSTERIOR RHINITIS IN INFANTS.—F. Göppert (*Berl. klin. Woch.*, May 19, 1913) states that in most cases coryza and catarrh in infants are of infectious nature. In artificially-fed infants such a catarrh has a very bad effect on nutrition, producing indigestion and diarrhea. In the Hospital for Children at Wiesbaden the author observed an epidemic of acute coryza in 10 children which spread to all in two weeks. All of them were more or less retarded in recovery from the disease for which they entered the hospital. In a few cases only the anterior nasal space is affected, the mucosa being swollen, and later thickened. The earliest attack of coryza often occurs within a few days of birth, and leaves a thickened mucosa which prevents the infant from breathing through the nose. The child nurses with difficulty and often refuses the breast or bottle. It keeps the mouth open constantly. In other cases the posterior nasal mucosa only is affected, or both may be involved. The thorax remains undeveloped, and the abdomen is long, large and tympanitic. Acute reinfection occurs constantly and the child gets into a deplorable condition. There may be real hypertrophy of the third tonsil. The obstruction is often at the posterior nares and with growth the condition is cured spontaneously. The use of a solution of adrenalin insufflated before nursing is often of great value to the child in chronic cases. The prevention of acute attacks by good hygiene is important.—*American Journal of Obstetrics.*

A SIMPLE METHOD OF PREPARING ALBUMIN MILK.*

BY B. RAYMOND HOOBLER, A.M., M.D.,
New York City.

The difficulty of preparing albumin milk from the formula originally given by Finkelstein, or of preparing any formula which requires the passing of the casein curd through a fine-meshed sieve two or more times has been a distinct drawback to its general use. It is true that it may be obtained already made at various milk laboratories by patients who can afford to pay for it, and it may be prepared in any hospital milk kitchen where there is a sufficient nursing force to do the work under competent supervision. It is very difficult to have it properly made at home; it is equally difficult to obtain it for dispensary use.

After it has been satisfactorily prepared there is still the problem of getting the child to take it. Even if the curd be passed as many as five times through a fine-meshed sieve there is a tendency for it on standing to re-form into small masses, which, in many instances, are too large to pass through the nipple, and unless someone is holding the bottle and shaking it frequently either the nipple becomes blocked or the curd settles to the bottom of the bottle.

During a very active service in the children's wards of Bellevue Hospital in August and September of last year the following simple method of making albumin milk was tried:—

Take 1 pint of fat-free buttermilk and add to it 1 pint of warm water, to which has been added 10 grams of powdered casein. This will make 1 quart of fat-free albumin milk.

If it is desired to have an albumin milk containing more fat one would follow the same procedure, but instead of using fat-free buttermilk one should use artificial buttermilk made from whole milk. After the casein suspension has been added the milk can be bottled and put on ice until ready to use. It will be found that the thick, smooth buttermilk will hold the finely divided particles of casein in a very even suspension, and allow same to pass through the nipple without blocking, and will stand for some time without settling to the bottom of the bottle.

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* Read before the New York Academy of Medicine, Section on Pediatrics, January 8, 1914.

The casein used was that furnished by Eimer & Amend, and on analysis was found to contain a small amount of fat, so that when made into the suspension as above suggested there would be .1 per cent. fat. No sugar was found mixed with the casein.

The formula of the albumin milk made from the fat-free buttermilk is: Protein, 2.8 per cent.; fat, .25 per cent.; carbohydrate, 2 per cent. The formula of the albumin milk made from the whole milk buttermilk is: Protein, 2.8 per cent.; fat, 1.75 per cent.; carbohydrate, 2 per cent.

These percentages, of course, will differ with the kind of milk used in making the buttermilk. Milk thus prepared has been used in those cases needing albumin milk both in private and hospital practice, and its therapeutic action in correcting diarrheal stools has been found to be identical with the albumin milk made in the regular manner. Metabolism studies have been made on children fed on this modified albumin milk, and the absorption and retention of nitrogen was in practically the same proportions as when fed on the original albumin milk. The details of these metabolism studies will be presented later. This casein flour costs 40 cents per pound, and is sufficient to make 44 quarts of albumin milk. To make the same amount from moist casein curd would require the use of 22 quarts of milk.

It would seem from the foregoing that albumin milk made from casein flour accomplishes in every particular the things expected of the albumin milk made up from fresh casein curd. The advantages of the use of casein flour in making albumin milk may be summarized:—

(1) It requires much less time in preparation.

(2) Instructions for making are very simple.

(3) It can be prepared in any home.

(4) The casein flour can be dispensed from a clinic and thus make the use of albumin milk available for dispensaries and milk stations.

(5) It does not block the nipple.

(6) It remains in an even suspension much longer than the original albumin milk.

(7) Its cost is less.

OBSERVATIONS ON MILK STATION INFANTS.*

BY MARK S. REUBEN, M.D.

Introduction.

This paper is based upon a study of about 1,500 feeding cases, which have been observed at the Vanderbilt Clinic Milk Station and pediatric department of the Vanderbilt Clinic since January 1, 1909. Nearly 500 of these cases have been observed for one year; about 900 of these cases were artificially fed, about 300 were breast fed, and about 300 received both breast milk and artificial feeding. That milk stations have a tremendous influence in reducing infant mortality is apparent everywhere they exist; at our own station only 19 infants died from January 1, 1912, to June 1, 1913; of these, 5 had been at the station only once; of the remaining 14 not one had died of gastroenteritis; of the 14 deaths that occurred among infants that had been at the station more than once, 5 had been breast fed and 9 were artificially fed.

There are four factors which are conducive to a low mortality at the milk stations. Arranged in importance, they are: education of the mother, clean milk, the nurse, and the physician. Education of the mother is by far the most important element; however, the other factors are indispensable adjuvants. It is for the visiting nurse, under proper supervision and guidance of a physician, to teach the mothers the physiology of infancy, to demonstrate to them how to prepare the milk formulas at their respective homes with the available utensils, to inculcate in these mothers the necessity of cleanliness at home, and to impress upon them the importance of regular and frequent visits to the milk stations.

For a physician to tell a mother how to prepare the food and to expect results, except in cases of extremely intelligent mothers, is a waste of breath and effort. All this must be done by the nurse at home. The home should be the place of education; moreover, the education must be of a practical nature. Anything which prevents the nurse from visiting the homes of these mothers frequently and regularly detracts from the efficiency of a milk station. In the mad rush to break records of the number of cases enrolled at these stations, the nurses are often forced to devote time to canvassing new cases which should be spent in visiting the homes of those already enrolled. The bad effects are immediately felt—the infants do not do as well. The best advertisement to induce new mothers to bring their babies to the milk stations is the knowledge that the milk stations' babies are doing well. One success means 10 new mothers; one failure will keep 100 mothers away, whether they are canvassed or not.

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* Read before the New York Academy of Medicine, Section on Pediatrics, January 8, 1914.

BREAST-FED INFANTS.

Everywhere one hears, and reads about, the diminution of breast feeding and the increase of artificial feeding. Judging from our own experience, breast feeding is not falling into disrepute. Of the 1,500 cases there were only 2 mothers who could but would not nurse their infants.

There are three important reasons why so many of the infants at our station are artificially fed. One is because a high percentage of these mothers, especially the colored women, do outside work after marriage. In the words of the husband of one of these women, who was asked what he did for a living, replied, "My wife goes out washing." Another important reason is that many of the mothers become gravid before their infants are three or four months old. "One a year" is the rule with many of the mothers that visit the milk stations. We had under our care an infant who was the nineteenth child, 17 of which are dead, born in twenty years of married life. Similar instances not so extreme are of every-day occurrence. "The infant mortality* in these families is out of proportion high; the rapid succession of births exhausts the mothers and compels the infants to be brought up artificially. Many of the infants, on account of the exhausted condition of the mothers, are born atrophic and prematurely. Many of these infants are unwelcome visitors. The remedy is simple; it is easy to suggest, but it is hard to carry it out. When one speaks to these mothers they say it does not depend on them, and in the majority of cases it does not. When such mothers ask a physician what they can do to prevent conception, it is futile to tell them not to have sexual intercourse and expect them to heed one's advice. Nothing that the doctor may say will make such intercourse unpopular with the poor and the ignorant, whatever the consequences may be; this is a subject which most physicians dread to touch upon, but it is a real, live subject which must be solved. There is no reason why a physician should not advise a woman (where there are proper indications) how to prevent conception; such advice may save the lives of many mothers as well as of many infants."

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* "Infant Mortality," M. S. Reuben, M.D., *Medical Record*, August 9, 1913.

And, finally, indifference and ignorance of the attending physician are responsible for the artificial feeding of many infants who should and could have been breast fed. It is amazing for what insignificant reasons babies are taken off the breast and put on the bottle. In cases of insufficient breast milk every expedient to increase the milk should be resorted to before advising supplementary or complementary feeding; even though the milk is insufficient there is not much danger to the infants, provided they receive plenty of water between nursings. During this time all attempts should be made to increase the milk supply through maltine, cornmeal, milk and other means. With the type of women we have to deal with at the milk station, the beginning of supplementary or complementary feeding means that within six to eight weeks the child will be entirely artificially fed. In cases where breast milk is insufficient, supplementary or complementary feeding when instituted should be dispensed with when the milk supply becomes plentiful.

Mothers frequently come complaining that they have not enough breast milk for their infants. That the usual way of estimating the quantity of mother's milk by weighing the infant before and after nursing is an erroneous standard, we are thoroughly convinced. In hospitals where infants can be weighed three or four times a day before and after nursing, and this procedure is repeated on different days, this method is not without value. But in an out-patient department a single weighing before and after nursing, even if repeated on different days, is not an accurate method. Many cases which gained only 1 to 2 ounces after such weighing, showed gains of 8 to 10 ounces at the end of the week on the breast alone. The only reliable way of estimating the sufficiency of breast milk is to observe the infant for at least one week on the breast alone, noting the weight at the first visit and at the second. By this method we have been able to retain many infants on the breast that would otherwise have been doomed to artificial feeding. In the mother's estimation the most important criterion of insufficiency of breast milk is the fact that the infant nurses only a few minutes; and in spite of the buxom appearance of the infant they still believe that they have not enough milk. On the contrary, we have found that this story usually means a rich milk and plenty of it. In cases of insufficient milk the infant usually hangs on to the breast for half an hour or longer, and it must be practically torn away from it. He also cries a good deal, sleeps badly and loses weight. It sounds paradoxical, but it is true, that the hardest task we have before us is to persuade mothers not to institute artificial feeding when the milk supply is sufficient in early infancy, and to induce the mothers to begin artificial feeding in later infancy when the breast milk is very scanty and the infants are practically starving. One mother refused to wean an infant for four months after the milk supply became insufficient, although the child at seven months weighed 16 pounds and at eleven months

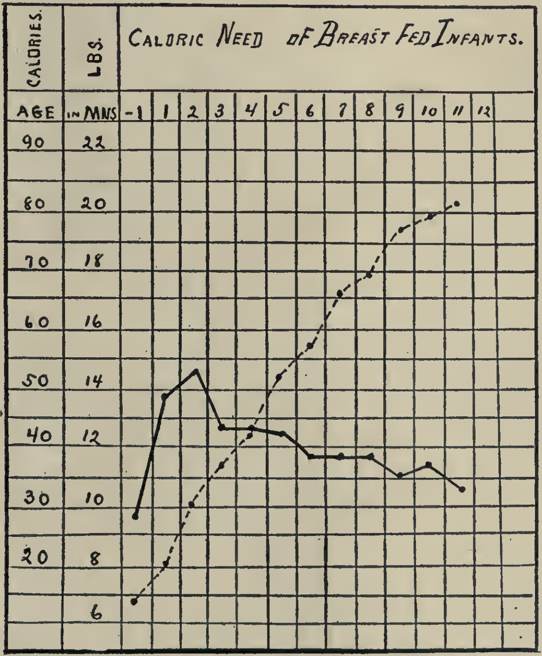

FIG. 1.—Curves of weights and caloric needs of breast-fed infants. (Heavy line, calories; interrupted line, weight.)

only 15 pounds, 9 ounces. In many instances this is due to the false impression the mothers have that they cannot become pregnant as long as they nurse.

Very few women who frequent the stations can nurse their infants longer than from twenty-seven to thirty-two weeks. If they continue to nurse until the end of the year the infants rarely gain more than 1 pound in the twenty weeks. We have, as a rule, weaned infants if their weight had been stationary or if they had lost in weight for two successive weeks, all other causes being excluded. These infants usually do very well on the bottle, and at the end of the year usually weigh more than those fed artificially from birth. We prefer weaning in two to four weeks to mixed feeding to the end of the year. Our experience has taught us that in later infancy, when the milk supply becomes insufficient, it is also of inferior quality, for the infants put on mixed feeding do not do as well as those weaned and fed artificially.

A STUDY IN WEIGHTS.

We studied the weights of infants (1) whose birth weight was over 10 pounds; (2) whose birth weight was about 7 pounds; (of these, three curves are given: (*a*) those who were breast fed for the whole year; (*b*) those who were artificially fed from birth; (*c*) those breast fed for thirty weeks and then weaned within four weeks and fed entirely on the bottle until the end of the year); (3) whose birth weight was between 4½ and 5½ pounds.

In studying the weights it became apparent that the greatest weight at the end of one year (of infants whose birth weight is about 7 pounds) is obtained by infants who had been breast fed until the milk supply had become insufficient (usually at twenty-six to thirty weeks), were then weaned within two to four weeks, and then entirely artificially fed. Infants who received supplementary or complementary feeding when the breast milk became insufficient (after six months) did not do as well nor did they weigh as much as those fed entirely artificially, when the breast milk became insufficient. This is probably due to the fact that these children are overfed. The mothers give these infants sufficient artificial feeding to thrive on, and the breast milk, although insufficient alone to make these infants thrive, in conjunction with the artificial feeding, makes the total food amount much too high. These infants cry a good deal from overfeeding. Their cry is invariably misinterpreted by the mothers as a sign of hunger, and they nurse these infants every time they cry, and all through the night. We have seen these infants improve immediately in temper and gain in weight on the withdrawal of the breast milk. From this and other studies we have become convinced that when the breast milk becames insufficient, especially in later infancy, it also deteriorates in quality.

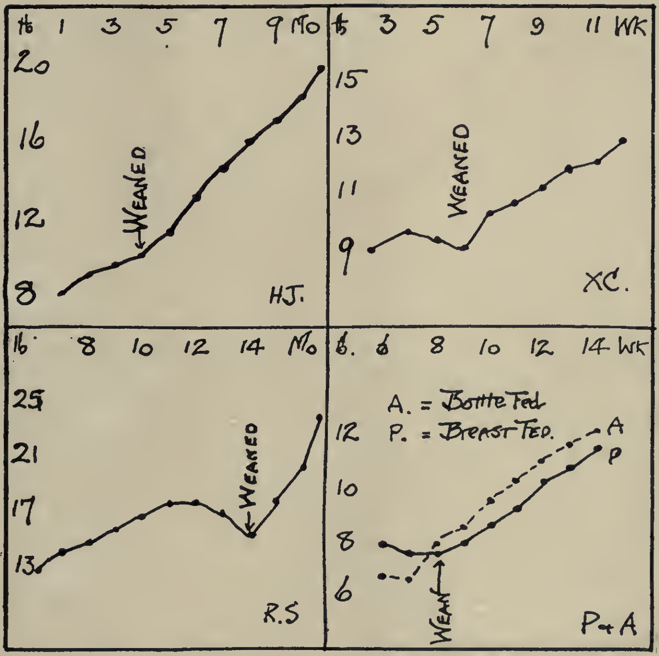

FIG. 2.—Curves showing gains in weight of 4 infants when weaned. (See p. 182.)

In early infancy insufficiency of breast milk is not infrequently met with. In the great majority of cases it is only temporary; the cases which do best under these circumstances are those in which the breast milk, under proper regime, becomes more plentiful, and then the artificial feeding should be stopped. Every ounce of breast milk should be conserved and utilized if it is good. An infant who receives a little breast milk (if it is good) can digest cow's milk much better than one entirely fed artificially; but as everything that glitters is not golden, so everything that comes from the woman's breast is not good milk. The idea is prevalent that all breast milk is good; this is far from the truth. There are mothers whose milk contains the right percentages of its elements, and in whom the quantitity of the milk is abundant, and yet their infants do not thrive, although these infants have no constitutional disease or diathesis to account for such lack of progress. This is most apt to occur in cases where the breast milk is insufficient. These infants do not do well on mixed feeding, but do much better on the bottle alone. In every case of insufficient breast milk one should try complementary or supplementary feeding for four weeks. However, if at the end of that time no progress has been made (provided all other causes were excluded), one should not hesitate to take such an infant from the breast and put it entirely on the bottle. The excellent results which are often obtained are really astounding.

H. J. gained less than 3 ounces a week on the breast alone. He was always fretful and irritable; did not sleep much; had no gastrointestinal symptoms; no constitutional disease or diathesis; the mother's milk was repeatedly examined and showed normal percentages; the quantity was plentiful; as there was no insufficiency of milk there was no indication for complementary feeding. After two months' trial on the breast the infant was put on the bottle; the infant became less irritable; slept more, and began to gain on the average of 6 ounces a week; the milk was right; the infant was healthy, but this breast milk was not the right milk for the infant. (See Fig. 8, p. 195.)

X. C. was obtaining only 1½ ounces of milk from the breast alone. Complementary feeding was instituted. At first there was a slight gain in weight; later the infant began to lose. Thinking that the infant was not receiving enough calories, we increased the milk. The infant continued to lose; having tried mixed feeding for four weeks, we did not hesitate to stop the breast, and, although we did not increase the amount of the artificial feeding, the infant immediately began to thrive.

A. and P., twins, illustrated this point very clearly. A., the smaller of the two, refused to take the breast, when complementary feeding was instituted. P., the larger one, took both the breast and the bottle. A began to gain immediately; P. began to lose immediately. The artificial feeding in both was the same. At the end of four weeks the breast was stopped in P. also, and he, too, began to gain, although he received no more artificial feeding than he did previously.

Breast feeding should always be advised and maintained in every case where it is of benefit to the infant; but in cases where the breast milk does not make the infant thrive, one should not hesitate to put such infants on the bottle. We have records of many cases which did not gain an ounce on breast milk in weeks and did perfectly well on the bottle. This is no plea for artificial feeding, but we have often seen infants kept for so long a time on the breast without gain in weight and with resultant colic and indigestion, that we find it of benefit to the infants not to wait too long before resorting to artificial feeding. Good breast milk is better than good artificial feeding, but good artificial feeding is better than poor breast milk.

The second highest curve at the end of one year is obtained by infants fed artificially from birth. It is midway between the curves of those fed on the breast entirely for one year and those fed on the breast for seven months and then fed artificially. Those breast fed for the entire year present the lowest curve, due to a mild starvation after the seventh month. It is evident that breast-fed children weigh at six months more than artificially-fed children, but after that the artificially-fed infants gain much more rapidly, and, as a rule, breast-fed infants gain about 10 pounds in the first seven months, and only about 2 pounds in the remaining five months; whereas the artificially-fed children gain about seven pounds each half year; they gain uniformly, except in the first six to eight weeks, when they gain slowly; but even at this time there are many notable exceptions. Very likely the slow gain in the early months is due to insufficient food.

Breast-fed infants with a birth-weight between 4½ and 5½ pounds usually weigh about 16 to 17 pounds at the end of the year; that is, provided they receive artificial feeding when the breast milk becomes scanty. Artificially-fed infants with a birth weight of 5½ pounds usually weigh about 16 pounds at the end of the year.

Eight infants, with an average birth-weight of $10^2/_{10}$ pounds, who were breast fed until the milk supply became insufficient, attained the average weight of $27^2/_{10}$ pounds at the end of one year. The greatest weight obtained by a breast-fed child was 30 pounds at eight months. This child weighed 8½ pounds at birth; and at eight months was taken from the breast because the mother had a pulmonary hemorrhage. The smallest infant under our observation was a premature infant weighing 1 14/16 pounds; it was referred to a maternity hospital.

ARTIFICIALLY-FED INFANTS.

Simplicity must be the keynote of artificial feeding at the milk stations. The degree of success depends to a great extent on how simple the milk formula is, and how well the mother understands how to prepare it. Over 90 per cent. of the artificially-fed infants did well on simple dilution of whole milk to which carbohydrates were added to make up the necessary calories. In our experience less than 8 per cent. of the infants who did not do well on whole milk mixtures did well on top milk mixtures.

One often hears that a certain infant has an idiosyncrasy to milk, and that it cannot take it in whatever form. In 1,200 cases we have met with one such case. That such cases exist we do not deny; that they are very rare we strongly affirm. In the great majority of cases the trouble is with the milk formula and not with the baby.

Of 200 feeding cases, which came to our notice at the milk station, in which the food was previously prescribed by a physician, only 19 per cent. had been put on milk formulas; 81 per cent. had been put on one or the other of the patented foods. There is only one explanation for this, and that is ignorance of how properly to modify fresh milk; anything which complicates infant feeding and makes it harder to understand and to carry out will cause many physicians to resort to patented foods. Infant feeding can be made both simple and successful in the great majority of the cases; our experience has taught us that.

In all our bottle babies we used simple dilutions of whole milk. We further modified the milk only when there were indications to do so. We never used lime water, barley or oatmeal water, or top-milk mixtures, unless there was some special indication to use them. We have followed the general rule that anything in the milk formula which does no good may do harm, and for that reason we omitted lime water and cereal diluents. That they are thoroughly useless in the great majority of cases, and that they can be dispensed with we are thoroughly convinced.

These modifiers only complicate infant feeding and in many cases do no good. When modification is necessary there are more potent means of doing so.

The great majority of healthy infants can digest cow's milk, properly diluted, without any difficulty. It is true breast milk is easier to digest than cow's milk, but still it is within an infant's normal limit of digestion to assimilate cow's milk properly diluted; it does so with a greater expenditure of energy, but still within the normal limit. The healthy heart is accustomed to perform a certain amount of work. When there is an extra demand upon it, it can very well accommodate itself by calling upon its reserve energy. It is in case of cardiac failure only that we use cardiac tonics and stimulants. Do we order a cardiac stimulant every time an athlete enters a race? The heart of the athlete accommodates itself to the extra demand upon it, and so does the stomach of the infant. By beginning artificial feeding

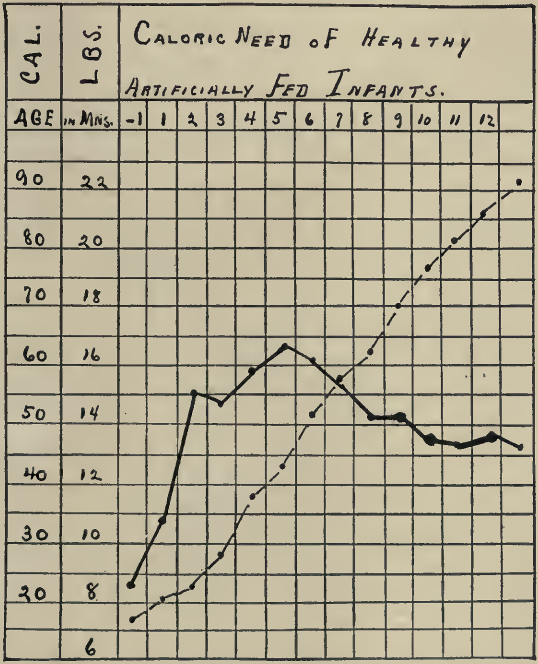

Fig. 3.—Curves of weights and caloric needs of artificially-fed infants. (Heavy line, calories; interrupted line, weight.)

with weak dilutions and gradually increasing the strength, we develop the accommodation power of the gastrointestinal tract just as the heart reserve is developed in the athlete; therefore, milk modifiers should be used only in cases which require it and not in a routine way—just as cardiac stimulants and tonics are used, only in decomposition.

In feeding the healthy artificially-fed infants we usually begin with a 1 in 3 mixture. Seldom was it necessary to prescribe a more dilute mixture. The quantity at each feeding we increased by 1 ounce every fourth week; the strength was increased as the weight and the symptoms indicated. On the whole, we found that infants can take much stronger mixtures than are usually given. The majority of infants who were bottle-fed from birth were taking half and half mixtures at two and one-half to three months, and whole milk at six and one-half to seven months. No infant received more than 1 quart of milk in twenty-four hours during the first year; the quantity of each feeding never exceeded 8 ounces; the intervals were never shorter than three hours, and when whole milk was given they were four hours. As soon as an infant stopped gaining on 1 quart of milk, flour was substituted for part of the sugar; later, cereals in form of gruels were added to the diet. Beef juice was usually prescribed at six months; earlier if the infants were anemic. If there was a tendency to constipation, orange juice was given early (at three months); otherwise it was ordered at six months. At nine months broths and zwieback were added to the diet; vegetables, finely mashed, were ordered when indicated.

Of the sugars we used a dextrin-maltose preparation in every case, unless there was some contraindication. We usually ordered 1 level tablespoonful of the sugar to every 10 ounces of the mixture—never exceeded 7 per cent.; usually 6 per cent. (1¼ tablespoonful in cases which did not show sufficient gain in weight.)

We have found that maltose-dextrin is not well borne by infants under two months of age, and that it is contraindicated in cases where there is a tendency to constipation. Dry maltose-dextrin preparations, unlike the fluid preparations, are not laxative; but, on the contrary, when used for a long time and in considerable quantities produce constipation. This sugar is also contraindicated in cases where there is vomiting. It is distinctly indicated in cases where there is a tendency to looseness of the bowels, and its greatest field of application is in babies that are much under weight. This sugar causes more rapid gain in weight than any of the other sugars. It should not be used in weaning.* Lactose seems to be the most laxative of the sugars, and we have often combined the two with great advantage. In early infancy we have mostly used cane sugar, and as the infant grew older we gradually substituted dextrin-maltose for part of the cane sugar. Regardless of which sugar is used, after a time, in certain predisposed cases, it tends to constipate; and in these cases we had good results changing one sugar for another. In cases that could afford to buy it we recommended Loeflund's malt soup; this was substituted for part of the sugar in the milk formula. This soup almost invariably produced the desired effect on the bowels, although it causes no greater increase in weight than the dry maltose-dextrin preparations.

One often hears that in healthy infants we get the same results no matter which sugar is used. This has not been our experience. Dextrin-maltose causes the greatest gain in weight, cane sugar less, and lactose produces the least gain. Their effect on the gastrointestinal tract is also different. Lactose has the least and maltose the greatest tendency to produce vomiting. Lactose is the most and dextrin-maltose the least laxative of the sugars.

Most text-books state that in healthy artificially-fed infants the food has to be changed five or six times in the course of the first year. We have found that to obtain the maximum gain in weight we must slightly increase the strength or the quantity of the food every ten days. We try to meet the demands of the infants and to develop their digestive powers gradually. Infants who receive one of three or four set formulas do not do as well, nor do they gain as much, as do infants fed in the way described. Here the infant has to accommodate itself to the food, and it not infrequently does so with temporary gastrointestinal symptoms and stationary or diminished weight. If infants did not gain in weight we increased the milk quantity in the formula. If this did not produce the desired effect we substituted starch for part of the sugar. In some cases we had to resort to top milk mixtures with excellent results. As a therapeutic measures in certain selected cases top milk mixtures produce results which no other mixtures do. In only a few instances did we have to resort to malt soup.

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* Infants very often refuse to take the milk mixture, because it is not sweet enough.

FEEDING OF INFANTS WITH NUTRITIONAL DISTURBANCES.

Because of the great tolerance which healthy infants possess, the great majority of them can be fed in the same way. In the case of infants with nutritional disturbances, where the tolerance for milk as a whole and for certain of its elements, is much diminished, every infant is a problem by itself; but here also we have found that simple dilutions of whole milk give excellent results. This is due to the fact that all the elements in diluted milk are of such low percentages that even some infants (not all) with nutritional disturbances begin to thrive on these mixtures. In these cases the increase in food is made more gradually. If there were any gastric symptoms present we never used dextrin-maltose until these symptoms,

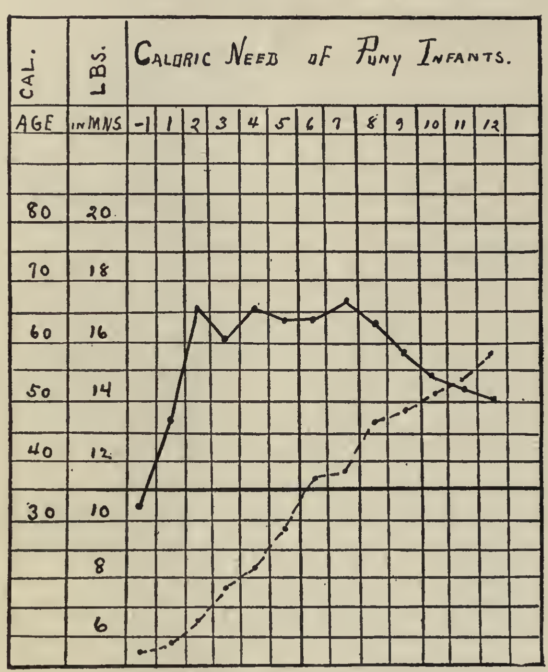

FIG. 4.—Curves of weights and caloric needs of puny infants. (Heavy line, calories; interrupted line, weight.)

subsided. Lactose was our sugar of choice when there was a tendency to vomiting and no tendency to diarrhea; otherwise we began with cane sugar. As all the sugars are more apt to cause fermentation than the flours, we have used the latter more freely in these cases than in healthy infants. The intervals between feedings were made longer. The quantity at each feeding, however, was very little less than a normal child of the same age would receive. The quantity of milk per day was considerably less than a healthy child of the same age would receive. To meet certain indications we have also used skimmed milk, and buttermilk with double carbohydrates, and eiweismilch. We take this opportunity of thanking the Walker-Gordon Company for supplying us with eiweismilch at a much reduced price, without which reduction it would not have been possible for many of our patients to have obtained it. On the whole, infants with nutritional disturbances, in many cases, do as well on simple dilutions of whole milk as do healthy artificially-fed infants.

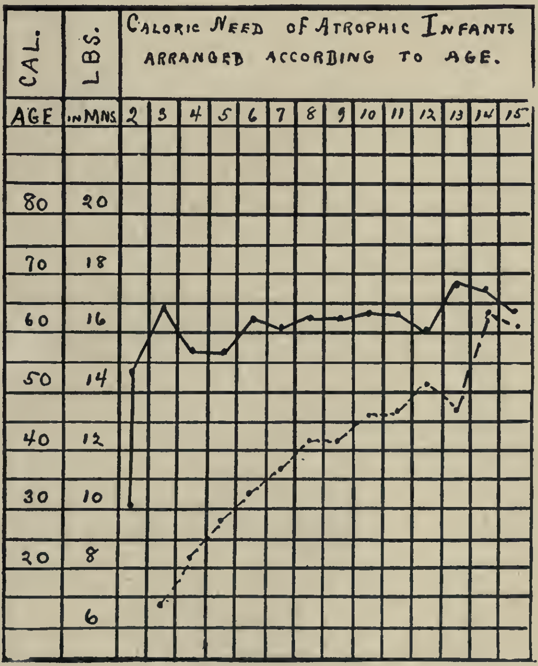

FIG. 5.—Curves of weights and caloric needs of atrophic infants.

A STUDY IN CALORIES.

From our artificially-fed babies we selected 40 cases, which had been under observation for at least six months, for the study of the calories in the food which they received. Ten of these cases were healthy artificially-fed infants, whose birth-weight was about 7 pounds, 10 whose birth-weight was between 4½ and 5½ pounds, 10 atrophic babies and 10 babies who for one reason or another did badly. As stated before, we did not feed any of these babies according to the caloric method. In prescribing the food we were entirely guided by the weight and symptoms of the infants; the calories in the food were estimated after the infants had been fed in the above method, to see whether the above groups of cases followed any definite rule in their caloric requirements. The caloric estimation was entirely retrospective. For comparative purposes we also give the caloric need of breast-fed babies as given in the German literature.

Study of Fig. 1 shows that breast-fed infants on the average require about 28 calories to the pound during the first month; that by the end of the first month the caloric need has risen to 49 calories to the pound; it rises to 52 in the second and drops to 43 in the third month; it falls slightly in the next three months. The caloric need is still less in the third quarter of the first year, and drops to 33 calories in the eleventh month.

Artificially-fed infants require at the end of the first month about 34 calories to the pound. This rises rapidly to 55 in the second month, is about the same in the third and fourth months, and rises a little in the fifth and sixth months. After the sixth month the caloric need becomes less and less and at the end of the year they require about 48 calories to the pound. (See Fig. 2.)

In comparing Tables 1 and 2 it is apparent that artificially-fed infants require more calories per pound than do breast-fed. On the average it amounts to from 15 to 20 calories more to the pound. The greatest caloric need of breast-fed infants is during the second month, and after that it becomes less and less. The caloric need of artificially-fed infants does not reach its highest point until the fifth month, and then gradually drops; but even at the end of one year these infants still require about 15 calories to the pound more than the breast-fed infants.

It is common knowledge that puny babies require more calories per pound than do large babies. This led us to estimate the calories in the food of 10 babies, the average birth-weight of whom averaged $5^5/_{16}$ pounds. In studying Fig. 3 we see that puny babies require more calories per pound than babies of average weight soon after birth; their greatest caloric need is during the second month. This high caloric need is maintained for about six months and then begins gradually to fall, and by the end of the year they still require about 5 calories to the pound more than do infants of normal birth-weight.

In studying the caloric need of atrophic infants we obtained a curve which is very similar to that of puny babies. In Table 4 these infants are arranged according to age. In Table 5 they are arranged according to length of time they were under treatment, regardless of age. In Fig. 4 we obtain an insignificant curve, whereas in Fig. 5 we have a very significant curve. Fig. 5 shows that regardless of age atrophic infants require about 30 calories to the pound before they begin to gain; that this must be quickly increased to 50 calories to the pound by the end of one month of treatment and to 60 to 65 calories in the next month. They require this high caloric need for about six months and then the caloric need becomes gradually less.

An infant may be getting the right number of calories and still may be losing weight. The food must be right not only in quantity, but also in quality. An infant receiving 660 calories in the form of whole milk may not gain an ounce. The same infant receiving the same number of calories in 7 per cent. milk may do perfectly well, so that calories *per se* mean nothing. There are other factors to be considered—as proper modification of the milk, the relation of the elements to each other (which is most important), the salts of the milk, and the amount of water which they receive, which have no caloric value, the cleanliness of the milk, the condition of the gastrointestinal tract, and constitutional disease. Moreover, the health and the weight of an infant depend not on how many calories are introduced, but on how many are absorbed and digested, and how many are expended in the digestion of the food. Foods which the infant cannot digest abstract energy from the infant and yield no fuel for future use. An infant may live longer on water alone than on a food which abstracts more calories in its digestion than it yields. Still, in some of the cases that did not thrive, we see that some received too many and others too few calories. The estimation of calories in the food of infants that are not doing well sometimes may explain the failure of gain in weight. We have found it of distinct value to calculate the calories in the food of infants that did not gain when we could find no cause for this failure to gain. Occasionally we found that the calories were too high, and reduction of same caused a gain in weight; and, on the other hand, we found that some babies did not thrive because the food did not contain sufficient calories, and increasing the calories caused a gain in weight.

To summarize, we may say the caloric estimation is of distinct advantage under the following circumstances:—

(1) In beginning to feed a healthy infant with the bottle we have a definite way of ascertaining about how much food the infant needs.

(2) In feeding atrophic babies and puny babies we know that they require more calories than do healthy infants of normal birth weight.

(3) In infants who are not thriving and where there is no apparent cause for failure to gain, estimation of the calories at times reveals that they are getting a food that is too high or too low in calories.

The caloric estimation of the food is of value therefore only at the beginning of a feeding case. After that the food should be regulated as the weight and symptoms indicate. In the cases that did well, and in which the food was increased according to the weight and symptoms, it is surprising how unconsciously we followed the general caloric requirements which were ascertained in the later study. Still it is much safer to feed each baby separately than to follow any general rules.

WHY SOME INFANTS DO NOT THRIVE.

In reviewing the cases which did not gain steadily or sufficiently we were very much impressed with the fact that the most common cause of this was irregular and infrequent visits at the station. For an artificially-fed infant to gain steadily the food must be increased in quantity and in quality regularly. Unless this is done the infants do not thrive. Breast-fed infants, as they grow older, obtain their increased demand for food by receiving a larger quantity of the same food. Artificially-fed children, however, as they grow older, must receive not only larger quantities, but also stronger food. It has been our experience that in artificially-fed infants the food has to be slightly increased about every ten to fourteen days to get the maximum gain in weight. If this is not done they at first gain less, then the weight remains stationary, and then begins to drop. At the stations mothers very often bring their infants once only in four, five or six weeks, all this time keeping the infants on the same formula. The result is that these children usually weigh less at the last

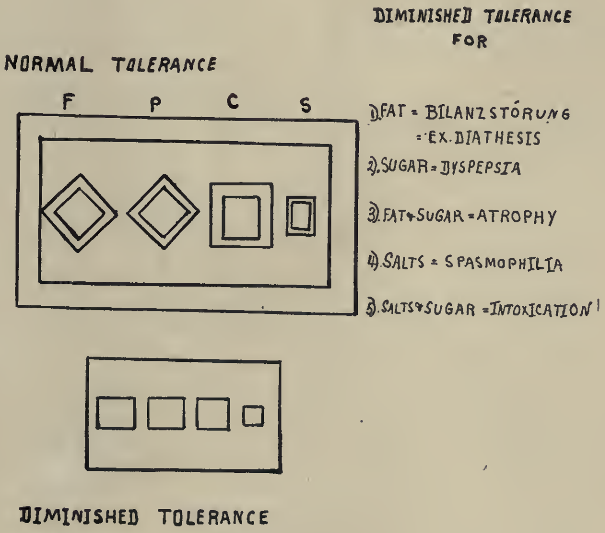

FIG. 6.

In the diagram representing normal tolerance, the inside rectangle (1) represents the least amount of milk on which a healthy infant will thrive; a healthy infant, however, can accommodate itself to an amount of milk represented by the outside rectangle (2), and still the infant will thrive; in health, therefore, within certain limits, increasing the amount of food causes a corresponding gain in weight. The same adaptability of a healthy infant is shown for the various elements of milk; in the squares, representing fat, carbohydrates, proteids and salts, the inner squares in all represent the low limit which must be present in the milk for the infant to thrive; the outer squares show to what extent each element may be raised in the milk formula, so that the infant may still thrive. It may be noted that the tolerance is greatest for carbohydrates and least for salts. If the salts are too low in a milk formula, there is no gain in weight; if they are too high, we get symptoms of intoxication. In health, the relation of the elements to one another is a variable one; this is shown in the diagram by the fact that the fat and proteid squares are represented in malposition to the other elements. In practice, this is exemplified by the fact that healthy infants can be made to thrive on top milk mixtures, whole milk mixtures, or buttermilk; in these three mixtures, the relation of the elements to one another is quite different.

In the diagram representing diminished tolerance, we note that the rectangle representing the amount of milk which the infant will tolerate is even smaller than the low limit in health; and any increase in quantity above this no longer causes a gain in weight, but a loss. The same is true of all the elements of milk. Depending upon which element the infant has a diminished tolerance for, we have different diseases. In nutritional disturbances, also, the relation of the elements is a definite one and cannot be varied as in health, and to show this diagrammatically, we represented the squares as parallel to each other. In studying the table adjoining these diagrams, we see why we can succeed in feeding infants suffering from bilanzstöring, dyspepsia and atrophy with simple dilutions of whole milk; and why we cannot do this in cases of spasmophilia and intoxication.

visit than at the previous visit. The infants are subjected to a low grade of starvation. The remedy is simple and effective. They must come regularly and frequently to the stations.

Another important reason why some infants do not thrive is extreme stupidity or ignorance of the mother or whomsoever the preparation of the milk formula is entrusted to. Very often when infants do not thrive close inquiry reveals that the milk formula is not prepared properly or that the home surroundings are very unclean. Often the preparation of the food is left to a ten-year-old child, and in a few cases to great-grandmothers. It is in these cases that the visiting nurse can accomplish much good; she must visit these homes frequently and supervise the preparation of the milk. It is surprising how much a daily visit for a week of a nurse can accomplish in such a home.

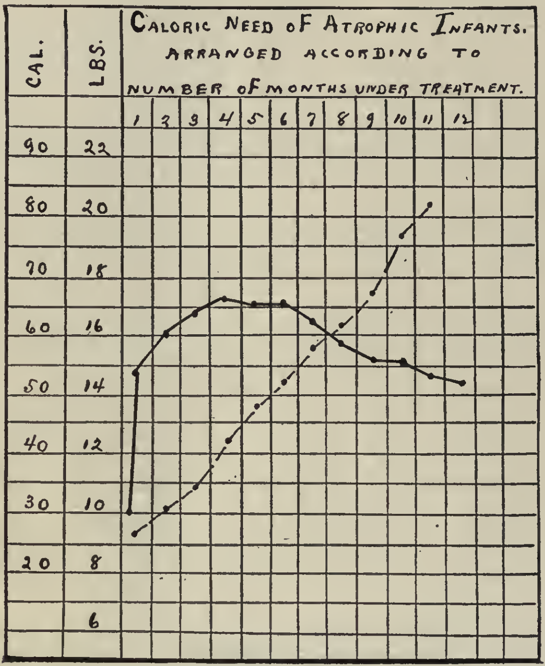

FIG. 7.—Curves of weights and caloric needs of atrophic infants, arranged according to number of months under treatment.

Still another reason why some infants do not thrive is the presence of some constitutional disease. A complete physical examination of every feeding case at its first visit is absolutely necessary. The feeding may be perfect, but the infant may not thrive. The diseases which we found most frequently kept infants from gaining in weight were: Syphilis, exudative diathesis, neuropathic infants, rickets, pertussis, chronic bronchitis, asthma and emphysema, acute otitis media (not chronic purulent otitis media), tuberculous infection, atelectasis, congenital heart lesion, pyloric stenosis and cleft palate. In all these cases we must first treat the underlying disease before we can expect any infant to thrive. We had the opportunity of observing three infants who became infected with tuberculosis before the age of one year. The history of infection was similar in all, so that the history of only one will be recited.

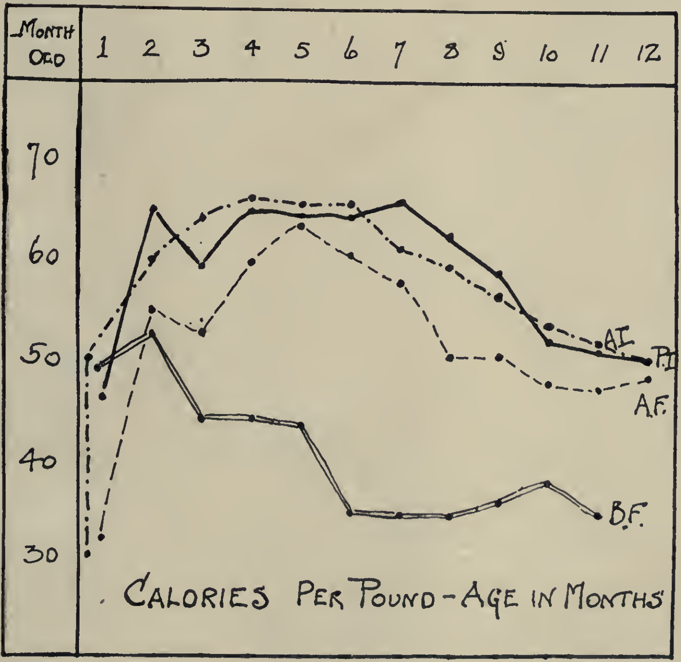

FIG. 8.—Composite of calory curves of Figs. 1, 3, 4, 7. AI = atrophic infants. PI = puny infants. AF = artificially-fed. BF = breast-fed.

C. T. was under observation from the age of six weeks. Weight at this time, $7\frac{8}{16}$ pounds. The infant did well until the age of twenty-two weeks, at which time he weighed $14\frac{9}{16}$

pounds. He suddenly developed fever, perspired freely and refused to take his food. The fever was 103° to 104° for three days, and gradually within ten days came down to normal. Absolutely nothing was found on physical examination. The von Pirquet reaction, which was negative three months previously, when it was taken in a routine way, was strongly positive. The infant did not do well for twenty weeks after this infection, but never had any physical signs. At eight months he had cervical adenitis. In the tenth and eleventh months he began to gain rapidly. The important lesson we learned from these 3 cases is that if infants who are doing well and who suddenly stop gaining have an acute febrile reaction and present no physical signs, we should always suspect tuberculous infection. We would further recommend the routine application of the von Pirquet test on every feeding case.

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ANAPHYLAXIS FOR MILK.—Hans Kleinschmidt (*Monats. f. Kinderhk.*, Bd. XI., Nr. 78, 1913) gives his results in the use of milk to cause anaphylaxis in animals. Healthy young guinea-pigs can be sensitized to cow's milk by way of the intestines. This is the case whether it be used raw or cooked for a short time. If it be boiled for a quarter of an hour the results will be inconstant. Sensibility is at first only to the albumin, but later it also occurs to the casein. Both may occur at the same time, or separately. There is no shock when the milk is used subcutaneously or by the intestines. Local cellular anaphylactic symptoms are absent, as are anomalies of the temperature, eosinophilia, and antianaphylaxis. Animals who have been subjected to hunger, or to the use of podophyllin, are generally refractory to the dose fatal to the heart. The Berkfeld filter removes from raw cow's milk the cause of the reaction. When this milk is used no reaction is obtained. No positive reaction was seen when inactivated milk which had been filtered was used.—*American Journal of Obstetrics.*

A STUDY OF THE CHILD IN THE TUBERCULOUS MILIEU.

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PART II.

In the diagnosis of pulmonary tuberculosis no single symptom or sign can be considered pathognomonic, excepting the finding of tubercle bacilli in the sputum. In many cases we found that children had coughed, had fever, lost flesh, showed physical signs of a local pulmonary infiltration, etc.; in short, presented a clinical picture of tuberculosis, but all efforts to obtain sputum for examination were unavailing. We found it not feasible to use Holt's method of swabbing the throat for the purpose, because the mothers would have strenuously objected, and we may have lost the cases altogether. In others in whom specimens were obtained, the results of a microscopical examination were negative in all cases but one, and this was a boy thirteen years of age, in whom a diagnosis was easily made by physical exploration of the chest. Young children do not expectorate, but swallow the sputum that may be brought up, but in addition they do not have as much sputum as adults have when tuberculous. It is well known to pathologists that necrotic processes in the lung are very rare in young children. While caseation is very frequent, softening is comparatively rare, excepting during infancy, when cavitation is quite common. However, pediatrists hold to a fast rule that negative sputum does not exclude tuberculosis in children.

Of the clinical and general symptoms, emaciation, when combined with other clinical signs, was considered important in the diagnosis. While not pathognomonic by any means, yet when a child loses or fails to gain in weight and coughs for any considerable time, and there are signs of unilateral affection of the lung, the diagnosis of tuberculosis may be made. However, we had two children with distinct lung lesions, yet they gained in weight during the eight months that we had them under observation. All the rest that were diagnosed as actively tuberculous either lost or failed to gain in weight.

Cough is spoken of as a cardinal symptom of tuberculosis in children by various authors. Hamburger says that it is never absent in incipient cases, and when a cough lasts more than a week the possibility of tuberculosis should be considered and a thorough search for all other signs and symptoms of this disease should be inaugurated. In the later stages of the disease cough may be lacking, especially when there is an arrest in the progress of the disease, which is not infrequently the case in children between eight and fourteen years of age. But even in these cases we meet with frequent exacerbations of the disease when the child coughs more or less. Stricker and Vogt say that the cough may serve as an indication of the time when the tuberculosis began, yet at times it is absent also in the incipient stage, which is clear when we bear in mind that it depends on the nature of the lesion and its localization, and whether there is any secretion which irritates the mucous membrane of the bronchi and trachea. Schlossmann also says that in infants cough may be entirely absent, and Holt is of the same opinion. Guinon[30] noted that only in advanced cases is cough present in infants, and it may be absent in cases with ulceration of the pulmonary tissue in older children.

Among the children here reported it was found that of those under one year of age only 7, or 21 per cent., were coughing. It is, however, noteworthy that the 5 who reacted positively to the cutaneous tuberculin test were all coughing more or less. In other words, of the 26 infants who did not react to tuberculin, only 2 coughed, while all who did react also coughed. Among the children over two years of age no relation could be found between the tuberculin reaction and the proclivity to cough. The reason is obvious when we consider the large number of children that cough from causes other than tuberculosis, notably those suffering from chronic rhinitis, pharyngitis, adenoids, hypertrophied tonsils, etc. Similarly it was found that those who showed symptoms and signs pointing to tuberculosis of the lung, or tracheo-bronchial adenopathy, were only slightly more prone to cough than others who were obviously free from these conditions. To a certain extent this may be explained that mothers

[30] L. Guinon, La Prat. des Mal. des Enf., Vol. IV., Paris, 1911, p. 569.

are apt to overlook slight coughs and respond negatively when asked about it, just as adults often say that they do not cough, although on careful inquiry we find that they do cough, "like everybody else," as they say.

On the whole, my observations lead me to the conclusion which is in agreement with Hamburger, that cough *per se* is not of great significance in the diagnosis of tuberculosis in children. Among children there are met with catarrhs of the nose and throat, especially during the winter months, which last for weeks and months without having any tuberculous substratum. When the general appearance of the child is good, especially its nutrition, and there are no signs of localized and circumscribed lesion in the lung, one need not be alarmed at a prolonged cough.

The temperature of the children reported here has not been studied as carefully as was considered advisable. To make a study of the temperature of a large number of children living with their parents scattered in various parts of the city would have required the services of many nurses and then difficulties would have been encountered, because many of the children attended school, and could not always be found at home when required three times a day. An attempt was made in a few cases, but had to be given up for these reasons. Taking the temperature only when the children were brought to the clinic was of no value, because a temporary elevation is of no significance, considering the instability of the temperature in early youth, and the manifold, often insignificant causes that may be instrumental in raising the temperature in infants and children. Of course in individual cases it is of great importance in the diagnosis of tuberculosis, and all the cases that were pronounced tuberculous were found to have fever. Our study of the fever was, however, not detailed enough to report on it.

Nightsweats were found to be quite frequent among these children. Of the 692 under observation, 245 gave a history of nightsweats. As a symptom of tuberculosis in children, it is often overestimated in its significance. In a study of the physiological phenomena of sleep in children, Czerny[31] has recently shown that the intensity of evaporation from the skin goes hand in hand with the depth of the sleep. At the time when sleep is most intense, at its maximum, the skin is warm and moist, and usually profuse perspiration on the face is noted. To be of diagnostic significance nightsweats must appear during the second half of the night and be so profuse as to soak through the bedclothes. Even in such cases the nightsweats are not pathognomonic of tuberculosis in children; the possibility must always be borne in mind that they may be of nervous origin, especially in older children. At any rate, nightsweats are not an early symptom of tuberculosis in children, but in advanced cases they are quite common. In all the undoubted cases of tuberculosis in this series nightsweats were observed, but many quite healthy and robust children were sweating at night, according to the testimony of their mothers. In tuberculous bronchopneumonia in children, nightsweats are almost the rule, but in non-tuberculous cases they are also often a prominent and annoying symptom. In chronic pulmonary or bronchial gland tuberculosis in children, nightsweats cannot be considered a cardinal symptom. While in advanced cases they may be quite pronounced, in incipient and doubtful cases they may be altogether lacking.

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[31] A. Czerny, Beobachtungen über den Schlaf im Kindesalter unter physiologischen Verhältnissen, Jahrb. f. Kinderh., Vol. XXXIII., p. 22.

As was already stated, the diagnosis of chronic pulmonary tuberculosis in these children was mainly based on physical exploration of the chest. It is, however, a fact worthy of emphasis that chronic phthisis is extremely rare in infancy and early childhood. Schlossmann says that it never occurs in infancy, that we meet it occasionally after the fourth or fifth year and from then on it occurs with ever-increasing frequency as we approach puberty. Hutinel found it only after the eighth year of life, and Holt says that it is rare before the tenth or twelfth year. Hamburger met with chronic phthisis as a cause of death only after the sixth year, while he says that before that age it is hardly ever seen. Sawyer[32] says that "consumption," as it occurs in adults is the rarest of all affections in childhood. On the other hand, Pollak[16] found in 17 out of 92 tuberculous infants pulmonary infiltrations, or cavity formation.

Among the children here reported, the youngest that was found presenting a localized pulmonary lesion, akin to the kind we meet in adults, was eight years old. After ten years of age many were encountered with this type of pulmonary lesions. But this does not exclude tuberculosis in children under six years of age. In addition to the cases of glandular, osseous, articular and meningeal tuberculosis that were met with, the high mortality of these children who lived in a tuberculous milieu must be borne in mind. This will be brought out later on in this paper, when the prognosis, mortality, and the causes of death will be discussed. I want to say here, however, that after the tenth year of life the lung lesions are, as a rule, exactly the same as those found in adults, the only difference is perhaps that while in adults lesions in the lower lobes of the lungs are exceptional, they are not uncommon in children between six and ten. Thus of the 19 children who showed distinct signs and symptoms of chronic phthisis, all of whom were over seven years of age, 5 had the main lesion at the lower lobes of the lungs. In 2 cases there were signs of cavity formation, one at the right upper lobe and the other at the right middle lobe.

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[32] J. E. H. Sawyer, "Frequency of Consumption in Children," Birmingham Medical Review, Vol. XIX., 1912, p. 57.

The signs elicited on physical exploration of the chest in older children are not unlike those met with in adults. We found infiltrations manifesting themselves in defective resonance, or dullness, localized and circumscribed at the apex, or lower lobe. Owing to the resiliency of the child's thorax, resonance is more easily elicited and airless tissue is more easily detected by percussion than in adults, provided we percuss very lightly. Heavy percussion is of little value in children, especially when we aim at detecting an incipient, or small circumscribed lesion. In infants the tubercular foci in the lungs are comparatively larger in extent than in children over four years of age; they run an acute course and lead to rapid cavity formation, soon terminating fatally. They are often treated as cases of pneumonia, or bronchopneumonia, unless the physician is on his guard. In tuberculous children over four, dullness in the chest is either due to enlarged tracheobronchial glands, or to thickened pleura with adhesions. True tubercular infiltration of the lung is met after the seventh year, when it may be elicited by percussion. The location is usually the interscapular space between the second and fourth thoracic spines, mostly on the right side, at the root of the lung, or hilus. Anteriorly, dullness at the sides of the sternum between the second and third rib, or over the manubrium is often met with in tracheobronchial adenopathy. The radiographic picture usually confirms the percussion findings—although I may say in passing that I find careful percussion more reliable than radioscopy in children.

Several things are to be borne in mind when interpreting percussion findings in children. Absolute and dense dullness is never met with in children, especially in the upper parts of the thorax. In those over ten, extensive pulmonary retraction at the base with thickened pleura may give dense dullness, but this is extremely rare. In cases of tuberculosis, dullness may be found in any area on the thorax and most frequently in the supraspinous and the interscapular and parasternal regions. To be of significance, it must be persistent, lasting for some time. I have met with dullness in children which disappeared within a few weeks, or even a couple of days. This is usually due to transient pulmonary atelectasis, or collapse of the alveoli, and is encountered in children of poor muscular development, who do not breathe deeply, or who take no exercise. Transient dullness may also be due to intercurrent pneumonia. Defective resonance due to tubercular infiltration of the lung, or to thickened pleura, is persistent. It is also to be remembered that in older children we may meet with dullness at the right apex due to collapse induration in mouth-breathers. In these cases, which simulate apical tuberculosis to a very high degree, we may see the dullness disappear after the cause of the mouth-breathing, like enlarged tonsils, adenoids, etc., is removed.[33] I have met with 9 cases of collapse induration among these children; all were over nine years of age. With a little care, they can usually be differentiated from tuberculosis of the right apex.

Auscultation is of greater value than percussion in the diagnosis of pulmonary tuberculosis in children than in adults. Of course I refer to those over six years of age, and who are intelligent and willing to assist the examiner. In infants, the signs of diffuse or capillary bronchitis, if persistent for more than a week, and accompanied by fever, are important. Cavities, which are more frequently forming than is generally appreciated, cannot be diagnosed during life, because the infant does not assist us while we examine its chest. Their frequency, as can be seen from a recent paper on the subject by White,[34] is undoubtedly great, and some believe even that they are more common than in adults. But inasmuch as acutely sick children were not brought to our clinic, we have not met with a single instance among these children. But these cavities can hardly be diagnosed *intra vitem*. Nearly all cases reported were found at autopsies. In those over six years of age, auscultation is a good means of revealing infiltration of the lung, or bronchial adenopathy. We meet with all the changes in the breath sounds that are characteristic of tuberculosis in adults. Harsh breathing is, however, of less significance in children, unless it is strictly localized and circumscribed and persistent. In one case, this was the only auscultatory phenomenon which, with dullness at the same spot, the left lower lobe, clinched a diagnosis confirmed later by the course of the disease. Broncho-vesicular and bronchial breathing is more often physiological in children than in adults, especially in the right interscapular space, and should not be considered of diagnostic importance unless there is also dullness at the same spot, and other symptoms and signs of phthisis. Of greater importance than bronchial breathing in the diagnosis of chronic pulmonary tuberculosis in children is feeble or absent breath sounds, localized at a given spot and persistent for some time. I have met this sign in many of the cases here reported and found it of greater value than any other single auscultatory sign. It is usually due to pulmonary atelectasis, caused by obstruction of a bronchus, either by secretions, or by pressure from without by enlarged bronchial glands. When the pressure is sufficient to produce complete stenosis of a bronchus, we get feeble or absent breathing in the area supplied by that bronchus; when the pressure produces only a narrowing of the bronchus, we may find bronchial breathing, and at times also pseudo-cavernous breathing, which will be spoken of later on. The breath sounds more often assume a sibilant or whistling character, and when this is heard at the sides of the sternum, or in the interscapular space, especially when audible only at one side, it is a good sign of enlarged bronchial glands. Feeble or absent breathing, when heard in the lower half of the thorax, is often difficult to differentiate from serous or purulent effusion into the pleura; and puncture, when resulting negative, often leaves us in the dark, as has been my experience in a recent case. In tracheobronchial adenitis, we often meet with bronchial or tubular breathing along the sides of the sternum. This is of great diagnostic significance when heard unilaterally.

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[33] See M. Fishberg, "Non-tuberculous Apical Lesions," New York Medical Journal, Vol. XCVIII., 1913, p. 14.

[34] C. Y. White, "Tuberculous Pulmonary Cavities in Infants," Transactions of the Sixth International Congress on Tuberculosis, Vol. II., p. 434.

Adventitious sounds, when met with, are of great assistance in diagnosis. We meet with crepitation in older children, who can be induced to cough at will, and in advanced cases with all varieties of moist râles. When diffuse all over both lungs they are of significance in infants, and very often indicate tuberculosis, as has already been stated. In older children, when localized at one spot, they may be due to bronchiectasis, or chronic pneumonia, and often only positive sputum findings can decide, as has been pointed out by Vogt.[35] In several children in this series, this difficulty arose and they had to be placed in the category of doubtful cases for the present. When, however, we find on auscultation signs of a cavity, we may decide in favor of tuberculosis, because bronchiectatic cavities in children practically never attain the size that will give distinct physical signs. Tuberculous cavities may be met with in children, even in infants, as has already been mentioned. Two of the children in this series had them. But we must be guarded in our diagnosis of cavernous breathing in children, because in children it is not always of the same significance as in adults. That great English clinician, Eustace Smith,[36] long ago pointed out that cavernous breathing, combined with dullness, gurgling rhonchis and increased resonance of the voice and cry, usually indicates a cavity near the surface of the lung, but in every case where these signs are met with we must not hurry to the conclusion that the lung tissue is excavated at that point. At the apex, such breathing may be simulated closely, as we know, by sounds conducted from the air tubes; and at the base, it is by no means to be accepted in every case as a sign of ulcerative destruction of lung. Cavernous respiration heard at the lower lobe of either lung is more commonly the consequence of bronchiectasis than of a cavity; but it may also be detected in cases where the sole pathological lesion present is a copious pleuritic effusion.

More recently, French writers have described in children "Bruits pseudocavitaires," which may resemble cavernous breathing to an extreme degree. Cadet de Gassicourt[37] believes that they are due to the smallness of the child's thorax and the thinness of its walls, while Rillet and Barthez[38] believe that compression of a bronchus by an enlarged gland may impart a cavernous or amphoric quality to the breath sounds at that spot.

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35. H. Vogt, Chronische Bronchiolektasie, Jahrb. f. Kinderh., Vol. LXXIV., 1911, p. 627.

36. Eustace Smith, "Wasting Diseases of Infants and Children," London, 1878, p. 259.

37. Quoted by Hutinel, Les Mal. de l'Enf., Vol. IV., p. 384, Paris, 1909.

38. Rillet et Barthez, Traité des Mal. des Enf., Paris, 1891, p. 1,140.

Wyss[39] also believes that enlarged bronchial glands may be instrumental in causing pseudo-cavernous breathing in children, and he has heard it in cases of pneumonia and pleurisy, and even in healthy lungs. According to Guinon,[40] they are very rare after the fourth year. In the 2 cases with cavities in this series, we met with most of the physical signs of this condition—tympany, cracked pot resonance, amphoric breathing, large, moist râles, or gurgles, and pronounced whispered pectoriloquy, all localized at one spot. Pseudo-cavernous breathing was heard in 4 cases, all under five years of age. In 2 there were also distinct signs and symptoms of bronchial adenopathy. Cracked pot resonance was heard in many, apparently healthy, chests of the children here reported.

In the diagnosis of enlarged bronchial glands, we have relied solely on physical signs, especially auscultation. While reading the numerous papers on the subject, one is amazed at the large number of symptoms and signs that are mentioned as characteristic of this condition. Stoll[41] has recently collated the literature on the subject and a survey of his work shows that there is no symptom or sign which can be considered pathognomonic and upon the significance of which more than two writers agree. Schlossmann[42] sums up the matter by saying that the diagnosis is difficult; if, after many thorough examinations of a child, we are unable to find the seat of the disease, we may suspect the bronchial lymph nodes to be the source of the trouble.

Of the subjective symptoms, the cough has been described as characteristic. Eustace Smith[36] was the first to draw attention to the peculiar character of the cough when the nerves, passing through the chest, are compressed, and he considers it one of the earliest indications of bronchial adenopathy. The cough becomes spasmodic, occurring irregularly in paroxysms, like those of pertussis, lasting only a short time and ending sometimes, although rarely, in a crowing inspiration. Sometimes the cough is hoarse and dry; at others, it is moist, with a rattling of mucus; at others

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39. Wyss, Ueber Perkussion und Auscultation der Säuglinge, Archiv. f. Klin. Med., Vol. LXXXIX., p. 363.

40. Guinon, Prat. des Mal. des Enf., Paris, 1911, Vol. IV., p. 467.

41. H. F. Stoll, "The Diagnosis of Tuberculosis of the Bronchial Glands," American Journal of Medical Sciences, Vol. CXLI., 1911, p. 83; American Journal of the Diseases of Children, Vol. IV., 1912, p. 333.

42. Pfaundler and Schlossmann, "Diseases of Children," Second American Edition, Vol. II., p. 632.

again, its quality is unchanged and presents nothing to attract attention. Schick,[43] basing his assertion on an experience with 36 cases, many of which came to autopsy, describes this respiratory crow, or stridor, resembling the sound heard in asthma and in capillary bronchitis. It can, however, be distinguished from the latter by the fact that in asthma the cough is paroxysmal in character, while the stridor in bronchial adenitis is continuous, lasting, without change, for weeks and months. This cough has been variously described by different authors. The French have mentioned it as "toux coqueluchoide," and Stricker compares it with the bark of a hoarse puppy. Friedjung,[44] and also Hamburger,[2] speak of it as more or less intense, loud and ringing, or metallic, and they say that this is the first and most frequent symptom of tuberculous bronchial glands in infants; and Pollock[16] says that it is just as pathognomonic of bronchial adenopathy as the paroxysmal cough is of pertussis. This "bronchial gland cough," when once heard is easily recognized in other cases. De la Camp[45] says that this cough can be provoked when the patient is made to swallow with the head bent backward. Schick, who made many autopsies on children who coughed in this manner, says that he always found compression of a main bronchus, mostly to the right, in its course from the trachea to the upper lobe of the lung. That this stridor, or metallic cough, is met with exclusively in infants of less than one year, Schick says is due to the softness of the bronchi at that age. On the other hand, Schlossmann[42] believes that it is due to pressure of the enlarged nodes upon the vagi nerves, while De la Camp says that the pressure is exerted by the infra-tracheal glands on the bifurcation of the trachea. I have known of a case in which this stridor was mistaken for whooping-cough, although a little care would have excluded the error in diagnosis, inasmuch as the bronchial gland cough is continuous and has no crowing, no nightly paroxysmal exacerbations, no glairy mucus, no terminal vomiting, etc., which are characteristic of pertussis.

In this series of infants only 2 had this kind of stridor, and both were less than one year of age. It is noteworthy that the

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43. B. Schick, Expiratorisches Keuchen als Symptom der Lungendrüsentuberkulose im I. Lebensjahr, Verhandl. d. Gesel. f. Kinderh., Vol. XXVI., p. 121.

44. J. K. Friedjung, Beiträge zur Diagnostik und Therapie d. Stenosen d. oberen Luftwege, Archiv. f. Kinderh., Vol. XXXV., 1902, p. 353.

45. De la Camp, Die Klinische Diagnose der Bronchialdrüsentuberkulose, Ergebn. d. inn. Med. u. Kinderh., 1908, p. 569.

diagnosis of bronchial adenitis could be made in these 2 infants without the stridor, because the symptomatology was quite characteristic. A stridor resembling the metallic cough of bronchial gland enlargements is also met with in other conditions, notably in cases of enlarged thymus and certain forms of capillary bronchitis; in fact, many forms of bronchial stenosis are accompanied by this kind of cough, while extensive tuberculosis in infants, even with enlarged bronchial glands, may exist without any cough at all. Of course, when encountered, this expiratory stridor in an infant suggests tuberculosis.

Another sign of enlarged bronchial glands, which has been described by Eustace Smith[36] and tested by many others, has been tried on some of these children. It consists in this: If the child be made to bend back the head, so that the face becomes almost horizontal, and the eyes look straight upward at the ceiling above him, a venous hum, varying in intensity according to the size and position of the diseased glands, is heard with the stethoscope placed upon the upper bone of the sternum. As the chin is now slowly depressed, the hum becomes less loudly audible and ceases shortly before the head reaches its ordinary position. Smith explains this phenomenon in this fashion: While the head is bending backward, the lower end of the trachea is tilted forward, carrying with it the glands lying in its bifurcation, and the left innominate vein, as it passes behind the first bone of the sternum, is compressed between the enlarged glands and the bone. I have looked for this sign in many of the children here reported and found that in those with flat chests it is never encountered, while in many that had no other symptoms and signs of tracheo-bronchial adenopathy, it was met with at times, while still others, who undoubtedly were thus affected, did not show this sign at all.

All the other symptoms and signs of this condition, which can be found enumerated in great detail in Stoll's[41] two papers mentioned above, are either lacking in most cases, or, when present, cannot be considered characteristic of bronchial adenopathy, and I took no note of them. Of great value is Koranyi's[46] method of spinal percussion, but it is not as useful in children as in adults. The splendid results obtained with this method by

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[46] F. von Koranyi, Ueber den Perckussionsschall der Wirbelsäule und dessen Diagnostiche Verwertung, Zeit. f. Klin. Med., Vol. LX., 1906, p. 295.

Da Costa[47] in this country, were with adults and not with children. My experience with children soon showed me that spinal percussion could give me no criteria worthy of the effort that it requires, and I soon abandoned it in favor of auscultation, which is more reliable for the detection of enlarged glands in the thorax. In fact, considering their topographical position at the tracheal bifurcation, it is self-evident that the glands must attain considerable dimensions before the percussion stroke will reach them. While in many cases dullness in the interscapular space in adults and older children is undoubtedly due to enlarged glands, yet we must have many confirmatory symptoms and signs before we can decide in each case.

About twenty-five years ago, A. d' Espine[48] described a sign of enlarged tracheal glands which is more satisfactory than any other sign or symptom. It consists in auscultation of the voice, especially the whispered voice, along the course of the trachea, posteriorly. He describes his sign as follows: The patient is told to count "one, two, three," or "thirty-three," as clearly as possible (younger children may be told to say "papa," "mamma") while the examiner auscultates with the naked ear, or better, with a stethoscope, the spines of the cervical vertebræ. As long as we listen to the cervical spines, we hear the characteristic tracheal tone, and each word is quite clear. In the normal child this clear voice stops abruptly as soon as we reach the seventh cervical spine and the lung begins; but in cases of bronchial adenitis the clearness of the voice continues lower down from the first to the fifth thoracic vertebra. It is at this spot that the main localization of the enlarged bronchial glands is found. The transmission of the voice in these cases is effected by the enlarged glands which surround the trachea at its bifurcation and often reach the spinal column, acting as sound conductors between the trachea and spine. When auscultation of the full voice gives uncertain results, the patient is told to whisper "thirty-three," which is even more reliable than the bronchophony just spoken of. It must always be borne in mind that in healthy children or adults the bronchophony and the whispered voice stops abruptly at the seventh cervical spine, and when heard lower it is a sure sign of something interposing between the trachea and the spine, and acting as a voice conductor.

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[47] John C. Da Costa, Jr., "The Practical Value of Spinal Percussion in Diseases of the Mediastinum," American Journal of Medical Science, Vol. CXXXVIII., 1909, p. 815; "Dorsal Percussion in Enlargements of the Tracheo-bronchial Glands," American Journal of Medical Sciences, Vol. CXLVI., 1913, p. 660.

[48] A. d'Espine et C. Picot, Traité des Mal. de l'Enf. I quote from the Sixth Edition, Paris, 1900, p. 856.

This sign of tracheo-bronchial adenopathy has been extensively tried in France, and many report that it is more reliable than any other sign. Barot[49] has tried on several hundred cases and found it satisfactory and named it "trachysigophonie"; Armand-Delille,[50] and many others, consider it a sign of first importance. In Germany, Zabel,[51] after discussing the difficulties in diagnosing bronchial glands, arrives at the conclusion that d'Espine's sign is the most reliable. In this country it appears not to have been given the trial that it deserves. Excepting Stoll's paper, already mentioned, I find it also spoken of by Sewall,[52] and by Honeij,[13] but I miss any mention of it in any text-book.

I have tested this sign in various ways and found it most satisfactory. In some cases in which the X-ray plate failed to show the presence of enlarged glands, d'Espine's sign revealed them clearly, and Zabel, as well as d'Espine, mentions cases which were confirmed by autopsies. Zabel[51] speaks of many young persons with some signs of tuberculosis, but no sign of bronchial adenopathy, even the X-ray failed to show them in five-sixths of the cases, yet spinal auscultation revealed them. Among the 692 children here reported, it was found that 61 presented this sign. Of the 19 with undoubted pulmonary tuberculosis, 16 showed the transmission of the spoken, or whispered, voice beyond the second thoracic spine. Considering the frequency of enlargement of the thoracic glands in tuberculous children, we can find here a confirmation of the value of this sign. In the 45 cases that showed no definite signs of pulmonary infiltration, but only d' Espine's sign, we found in all some other confirmatory symptoms of tracheo-bronchial adenitis, such as loss of weight, emaciation, pallor, pasty complexion, enlargement of the superficial thoracic veins, chronic cough of a dry, hacking character, dullness in the interscapular space, bronchial breathing, or harsh and prolonged expiratory murmur at the sides of the sternum or in the interscapular space, etc. Of course not all these symptoms were found in each case, but one or more were met with in each one that presented d'Espine's sign.

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[49] Barot, De quelques signes cliniques permettant de déceler la tuberculose dans son stade primitif de germination ganglionaire, Arch. Méd. D'Ang., Vol. XI., 1907, p. 18.

[50] P. F. Armand-Delille, Diagnostic et traitment de l'adenopathie tracheobronchique, Paris, 1911.

[51] B. Zabel. Bronchialdrüsendiagnostik, Münch. Med. Woch., Vol. LIX., 1912, p. 2,664.

[52] H. Sewall, "The Auscultatory Determination of Early Pathologic Changes in the Lungs," Journal of the American Medical Association, Vol. LX., 1913, p. 2,027.

[53] J. A. Honeij, "The Importance of the Mediastinal Glands," Journal of the American Medical Association, Vol. LVII., 1913, p. 2,027.

PROGNOSIS IN THE CHILD IN THE TUBERCULOUS MILIEU

The outlook of the child infected with tubercle bacilli has been pronounced extremely gloomy by most authors, and, considering that the children in the 217 families here reported have practically all been infected, or will be infected within the near future, we should accordingly expect them to perish before reaching maturity. It is indeed horrible to contemplate the fate of these children, handicapped as they are by heredity and an unfavorable social and economic environment, in which they cannot escape infection, if the extremely gloomy outlook cast upon such individuals is well founded. I find in the literature on the subject that Monti[54] says he never saw a case of tuberculosis cured in an infant under two years of age. Schlossmann says that he does not know of a single case in an infant which resulted in a cure; von Pirquet maintains that 90 per cent. of infants infected during the first year of life perish; Louis Guinon[55] says that before the fourth year tuberculosis is always fatal, and Holt[56] holds that the outlook for a young child with general or pulmonary tuberculosis is always bad.

The number of families investigated is not large enough to offer a basis for the calculation of the mortality of the children in the tuberculous milieu, or to find the coefficient of the expectation of life. I can, however, investigate the number of children that died among these families and the causes of death and thus get an approximate opinion as to the outlook for the child in the tuberculous milieu, and whether all the infants infected with tuberculosis really perish.

As already stated, we found in these 217 families, 692 living children under fifteen years of age. An inquiry was also made into the mortality and the causes of death among the descendants of these tuberculous parents, and the following conditions were elicited: Altogether, there died among these families, 229 children under fifteen years of age. Of these 14 died from scarlet fever, 11 from measles, 13 from diphtheria, 1 from pertussis, 22 from cholera infantum, 3 from cardiac disease, 14 from accidents and injuries, 23 from pneumonia, 32 from meningitis and 17 from tuberculosis. The mothers who gave this information, also stated that 79 children died from causes of which they are ignorant. Of these, I find that 58 died during the first three months of life. I meet with such entries made by the nurses: "Seven children died soon after birth, cause unknown to mother"; "three infants died during the first three months, cause cannot be ascertained." Of course some of these infants died from congenital debility, as I have convinced myself by interviewing some of the mothers in detail. But many of them also died from tuberculosis, but the mothers, ignorant as they are, had either forgotten the circumstances surrounding the death, or never knew beyond the fact that the child was sick and died.

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[54] Monti, Ueber Tuberkulose, Kinderheilkunde in Einzeldarstellungen, 1901, Part 9.

[55] Louis Guinon, La Prat. des Mal. des Enf., Paris, 1911, Vol. IV., p. 479.

[56] Holt, "Diseases of Infancy and Childhood," Fifth Edition, p. 1,004.

The small number of deaths attributed to tuberculosis, only seventeen being recorded on my cards, may be explained by this cause and also by the fact that many of the cases of pneumonia, measles and cholera infantum, etc., died, in fact, from tuberculosis. The large number of deaths caused by meningitis, 32 of a total of 229, or 14 per cent., is appalling. Among the general population of any social class there is no such mortality from meningitis as one out of six deaths under fifteen years of age. This high mortality is even more formidable when we consider the deaths under six years of age. We find that among 188 deaths that occurred in these families of children under six years of age, 30 were due to meningitis. In other words, 16 per cent. of the mortality of children under six were due to tuberculous meningitis. According to the census of the United States, there occurred in Manhattan during 1910, 470 deaths from tuberculous meningitis among the white population in 37,129 total deaths, or 1.27 per cent. In children under five years of age there occurred 374 deaths from tuberculous meningitis among 12,490 total deaths, or 2.6 per cent. Comparing this with the 16 per cent. found among the deaths of children living in a tuberculous milieu, we have a drastic illustration of the ravages of tuberculosis during infancy and childhood.

While the number of deaths stated as caused by pulmonary tuberculosis is not very excessive, only 17, or 7.3 per cent., of all the deaths, the fact must be borne in mind that many cases of infantile tuberculosis are not recognized by physicians, or forgotten by the parents, or the infants die in hospitals, the parents remaining in ignorance of the true cause of death, as is quite often the case with immigrants. Of the large number of deaths of infants under six months of age, a large proportion was undoubtedly due to tuberculosis, though we have no means of ascertaining the real number.

But is the newborn infant in the tuberculous milieu doomed to die within the first two years of its existence, considering that it has but few, if any, chances to escape infection? This question can be answered only after we consider the problem whether all infections during infancy run an acute course, showing no tendency to heal, and clinically, whether any infants survive infection.

It is the consensus of opinion of many pediatrists that all tubercles during the first three years of life are active, that the lungs show no tendency to heal, and that there are no reparative processes to be noted when examining lungs of children that succumbed to tuberculosis. Schlossmann[42] says that there is not a positive instance where a tendency toward the limitation of the disease was observed in infants. The tissues of the infant do not seem to be able to respond by protective inflammatory reaction. The result is that the lesions do not become circumscribed nor calcified. But here, again, his experience is based on hospital cases, *i.e.*, cases that, because of the strong acuity of the tuberculous process, came to autopsy, and we may argue that among the many infants who survived infection there must have been a natural repair of the tuberculous focus in the lung. In fact, there are some records of autopsies confirming this view. Just as with adults, though not as frequently, healed lesions have been found in infants. Schlossmann[57] himself describes an autopsy of an infant of fifteen months, in which the lungs showed distinct evidences of regeneration of a tuberculous lesion, though no signs of calcification could be discerned. Küss[58] reported a case of miliary, but entirely calcified lung lesion, in an infant of eleven months, and also a partially calcified lung tubercle in a fifteen-months-old boy. Maleterre[59] describes a case of complete healing of a tuberculous process in a two-year-old infant; in the lung of the child that died from bronchopneumonia he found a single calcified tubercle, the size of a lentil, and also a cheesy bronchial gland. Hohlfeld[60] met with fibrous changes in the lung of a ten-months-old baby and also in one thirteen months of age. Aronade[61] even saw a case of encapsulation around a cheesy focus in the upper lobe of the lung in a thirteen-months-old infant, and Ghon[62] found encapsulation in 3 cases during the first year of life, one an infant of three months. In children over three years, fibrous changes, encapsulation and calcification of tuberculous lesions in the lungs are not extremely rare. Minski[63] describes a case in a four-year-old child, in which at the autopsy there were found fibrous tubercles in the lung, the bronchial and mesenteric glands; in addition, there was found a cheesy and calcified focus in the lung, and Oppert[64] found calcified glands at the autopsy of a four-and-a-half-year-old child. Geipel[65] also describes calcification in the lungs, lymphatic glands and spleen in an infant of six months that died from miliary tuberculosis; and in one of eight months, calcification of the bronchial glands. Engel[66] saw a case of a one-year-old infant, showing at autopsy calcified foci in the lungs and spleen, together with active tuberculosis of the glands and bones; and Hahn[67] shows that not all cases of tuberculosis in infants under one year end fatally; in many cases there is a decided tendency to healing. Pollak[16] found that one-third of the number of tuberculous infants are alive and well after the first year.

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[57] A. Schlossmann, Ueber die Entstehung d. Tuberkulose im frühen Kindesalter, Arch. f. Kinderh., Vol. XLII., p. 101.

[58] G. Küss, De l'héredite Parasitaire de la Tuberculose Humaine, Thése de Paris, 1898, p. 298.

[59] Maleterre, Contribution a l'Etude de la Tuberculose de la Premiére Enfançe, Thése de Nancy, 1905, p. 52.

Our experience with these tuberculous families, while showing that the child in the tuberculous milieu is always in grave danger, especially during its first three years of life, also confirms the autopsy findings just cited. While the vast majority of children in the tuberculosis milieu are infected with tuberculosis during the first three years of their existence, in fact very few escape infection, and although an appalling proportion suc-

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60. Hohlfeld, Ueber Säuglingstuberkulose, Verhandl. d. Ges. f. Kinderh., 1907. p. 26.
61. O. Aronade, Ueber Säuglingstuberkulose, Beitr. zur Klin. d. Tuberk., Vol. XIII., 1909, p. 304.
62. A. Ghon, Der Primare Lungenherd bei der Tuberkulose der Kinder, Berlin, 1912, p. 49.
63. Minski, Zur Frage der Tuberkulosenheilung im frühen Kindesalter, Inaugural Dissertation, Freiburg, 1908.
64. E. Oppert, La Cutireaction a la Tuberculine, Thése de Paris, 1908, p. 81.
65. Geipel, Ueber Säuglingstuberkulose, Zeit. für Hyg., und Infektionskrankheiten, Vol. LIII., 1907.
66. Engel, Ueber das Verhalten der Kindlichen Tuberkulose gegen Tuberkulin, Beitr. z. Klin. d. Tuberk., Vol. XIII., 1909, p. 304.
67. H. Hahn, Ueber die Prognose der Säuglingstuberkulose, Monat. f. Kinderh., Vol. X., 1912, p. 531.

cumb to the various acute tuberculous diseases, especially meningitis, yet many do survive infection. In fact, here we have 217 families in which either one or both parents are tuberculous, yet they raise children to adolescence and maturity. But this does not prove that the contention of those entitled to speak with authority, to the effect that tuberculosis during infancy is dangerous, is not based on fact. A study of my material shows that the danger of developing active phthisis is in an inverse ratio to the age at which infection takes place. The younger the infant the more unfavorable the prognosis, and children over four years of age, while sure of becoming infected, if they live in a tuberculous milieu, yet only rarely develop acute or chronic progressive phthisis. On the other hand, an enormous proportion of the infants infected with tuberculosis succumb to some one of the forms of the disease very soon. Among these children it was found that very few of the infants born after the father or mother became tuberculous survived, while those who were over four years of age when the phthisis made its appearance in the family show evidences of latent tuberculosis, reacting to tuberculin, or even some signs and symptoms of tracheo-bronchial adenopathy, but active tuberculosis is exceedingly rare among them. We know that many of these were subjected to massive infection, and will probably develop phthisis in later life, but for the majority of those who survived and show no signs or symptoms of disease, the danger of developing active tuberculosis is by no means more acute than with the average population, perhaps even less, as will be pointed out later on.

GENERAL OBSERVATION.

The high infant mortality in these families was undoubtedly preventable, if proper measures had been taken to remove these infants from the tuberculous milieu in which massive infection was inevitable. It is, however, questionable whether the milder forms of tuberculous infection during infancy and childhood can be prevented at all in a large city like New York. From the statistics brought together in this paper when discussing the tuberculin reaction, it appears that on the whole we do not find that the proportion of infected children was much larger than is found among children who live in large cities in families in which there is no case of open tuberculosis. Schlossmann's statement to the effect that in children of the well-to-do infection is exceedingly rare is not supported by any valid evidence, based, as it is, on general impression which, at best, is liable to prove erroneous. On the other hand, at Lille, Düsseldorf, Vienna, Manchester, Edinburgh, etc., the proportion of children reacting positively to tuberculin is almost as high, in some even higher, than among the children here reported.

It is a fact which must not be overlooked that investigations made in various parts of the civilized world show conclusively that there is no place which can be considered free from opportunities for infection with tuberculosis—the ubiquity of the tubercle bacillus is even more pronounced than has been appreciated. This should be emphasized here, in order to prevent some from drawing conclusions which are not justified. Thus P. Jakob[28] investigated small rural communities in Germany, where very few tuberculous persons can be found, and the chances for infection, as is generally believed, are practically *nil,* yet he found that of those under six years of age, 35.6 per cent. reacted, and of those between six and fourteen, 45.9 per cent. reacted. He found houses in which there were persons with "open" tuberculosis, where practically all the children reacted to tuberculin, but he also found houses in which there was evidently no source for tuberculous infection, or contact with a person suffering from this disease, yet many of the children reacted positively to the cutaneous tuberculin test. In some villages in which no case of tuberculosis had occurred for many years, 30 to 40 per cent. of the children reacted to tuberculin. Hillenberg[29] investigated a rural district in which there had not been any cases of "open" tuberculosis for several years, and obtained 25.9 per cent. positive reactions. Direct infection from consumptives could be excluded in most cases, because in some villages there had been no case of death due to tuberculosis for many years, yet the children were infected to a considerable extent. While the percentage of positive reactions varied from 10 to 61.7 in the various villages, yet it is a striking fact that the highest percentage of positive reactions was found in a village in which there had been but 1 case of tuberculosis during the last ten years, and the social conditions were very favorable. Bovine sources of infection were excluded by Hillenberg, because no case of intestinal tuberculosis has been met with in these communities for ten years, and for other reasons.

How have these children become infected with tuberculosis?

Römer[68] suggests that perhaps latent tuberculosis, which is more widespread than is generally appreciated, can disseminate the disease in some manner with which we are as yet unacquainted. That this is not a mere hypothesis is clear, when we bear in mind certain observations made by veterinarians. It has been noted that the introduction of a cow which reacts positive to tuberculin into a stable with cattle known to be free from tuberculosis often brings about infection of all the cattle, so that ultimately they all react to tuberculin, although it cannot be shown that the cow was clinically tuberculous, or has disseminated tubercle bacilli. Among human beings there are undoubtedly tubercle baccillus "carriers," *i.e.,* individuals who harbor the germs of the disease, but show no signs of sickness, just as is the case with other diseases, like typhoid, etc. The only difference is that in the case of tubercle bacilli, the microorganisms are not always harbored in the canals lined by mucous membranes, but also at times within the tissues of the body, and we can speak of them as endophorous bacillus carriers, as Orth[69] points out. These people, living under good social, sanitary and hygienic conditions, may never develop phthisis, but they may mildly infect those around them, as we saw was the case with the rural populations investigated by Jakob and Hillenberg.

The difference in the infection of the children we investigated in New York and those in the rural communities just mentioned may be due to the quantity of the bacilli that have been introduced into their bodies. While those in the rural districts have only occasionally inhaled a few microorganisms, which have not made them sick with phthisis, but only brought their organisms into an allergic state, as revealed by the tuberculin test, those who lived in New York, in a strongly tuberculous milieu, have received massive doses of strongly virulent bacilli, and the result was that many of them succumbed to hematogenous tuberculosis, notably meningitis; others remained with either chronic phthisis, or tuberculous tracheo-bronchial adenitis; still others merely show the infection by the tuberculin reaction, etc. The experimental and clinical evidence to the effect that the size of the dose of microorganisms has a great influence on the effects produced by infection with tubercle bacilli is confirmed by our investigations, although we could not confirm Pollak's[24] observation that

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68. P. Römer, Kritisches und Antikritisches zur Lehre von der Phthisiogenese, Beitr. z. Klin. d. Tuberk., Vol. XXII., 1912, p. 301.
69. J. Orth, Drei Vorträge über Tuberkulose, Berlin, 1913, p. 12.

infection from persons suffering from severe forms of pulmonary tuberculosis is more dangerous for the child than infection from mild cases.

Our investigations also give us hints as to prophylaxis. It is evident that while we may not be able to prevent mild tuberculous infections of children in large industrial cities like New York, with its overcrowded tenements, still we can prevent massive infection by removing children from the tuberculous milieu, or by removing the source of the bacilli, those with "open" tuberculosis, from contact with children. This is the main reason why of late the prophylactic measures taken against the spread of tuberculosis are directed more against the massive infections of infants and children than against the dissemination of the disease among adults. The tuberculization of civilized humanity is apparently inevitable and has been going on at a rate and in a manner which is not appreciated by all who are interested in the prevention of disease and, as we have seen, the vast majority of people living in cities are infected before they attain maturity. But mild infection, which shows itself only by the positive tuberculin reaction, is apparently not harmful, and some are of the opinion that it is even beneficial to a certain degree. Reinfection, experimentally and clinically, has been found to be impossible by Koch and Behring. Recent investigations by Römer,[70] Calmette,[71] Hamburger,[72] Baldwin,[73] and others, have shown that the tuberculous are relatively immune to exogenous infection with tubercle bacilli. In so far as it is not acutely fatal, infection with tubercle bacilli enhances the resistance against renewed infection, while persons who have never come in contact with tubercle bacilli are the most vulnerable to its effects. The immunity which is acquired by mild infection during childhood is usually sufficient to protect the individual against exogenic infection in later years. On the other hand, those who receive massive doses of bacilli during infancy or childhood, may either succumb soon to some form of acute tuberculosis, or harbor a tuberculous lesion in their bodies till adolescence or maturity, when some exciting cause may at any time reawaken

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70. P. H. Römer, Tuberkulose-Immunität, Phthiseogenese und Praktische Schwindsuchtbekämpfung, Beitr. z. Klin. d. Tuberk., Vol. XVII.
71. Calmette, Quelques a perçus Noveaux sur la Question de la Vaccination Contre la Tuberculose, Presse Méd., 1912, No. 15.
72. Hamburger and Toyofuku, Ueber Immunität tuberkulöser Tiere gegen Tuberkulöse Inhalationsinfektion, Beitr. z. Klin. d. Tuberk., Vol. XVIII., 1910; Ueber Tuberkulöse Exacerbation, Wien. Klin. Woch., 1911, No. 24.
73. E. R. Baldwin, "Allergy and Re-infection in Tuberculosis," Johns Hopkins Hospital Bulletin, Vol. XXIV., 1913, p. 220.

the dormant process and we thus get endogenic, or metastatic, reinfection, producing the subacute or chronic type of tuberculosis, which is so common. In other words, phthisis is a metastatic infection in which a massive infection acquired during childhood flares up and, before killing the individual, makes of him an excellent breeding place for bacilli, which he disseminates among those around him.

The prophylaxis of tuberculosis can only be carried out by preventing such massive infections during infancy and childhood as we have seen takes place in such a tuberculous milieu as found in 217 families investigated and reported in this paper.

RECAPITULATION.

The children in 217 families, in which either the father or mother, or both, were found tuberculous, were investigated. They were found living under conditions greatly favoring the dissemination of the disease. Of 274 consumptives found among these people, only 112 slept in a separate room, and 136 slept in beds by themselves; the rest shared their rooms, or beds, or both, with other persons. Their economic condition can be summed up by saying that they were at the end of their resources, otherwise they would not have applied for relief. Inasmuch as these children were burdened by both a deleterious environment and a tainted heredity, they should offer splendid material for the study of the effects of the tuberculous milieu on children.

Of the 1,129 persons comprised in this group of families, 792 were under fifteen years of age. Nearly all of these children were reared on breast milk, only 5.5 per cent. having been brought up on artificial feeding. The proportion reacting to tuberculin was not found to have been influenced by the manner of feeding during infancy. Some mothers suffering from active tuberculosis were found suckling their infants, and the latter apparently thrived as well as others of their class; many, however, infected them with active tuberculosis.

The weight of the infants was fairly normal, but the children over four years of age were deplorably short of weight when compared with others of their class. At the age of eight, they lack 3.67 kgms., and at fourteen, even 7 kgms. of the average. During the six months they were kept under observation, one-half remained stationary in weight, 40 per cent. had lost and 10 per cent. had gained in weight. The form and shape of the chest was normal in 62.5 per cent. of the children; 27.5 per cent. had flat chests, and 10 per cent. rachitic chests. The large proportion of flat chests is not necessarily an indication of the habitus phthisicus, because Jewish people are known for their flat chests.

In 8 per cent. of the children enlarged superficial thoracic veins were found. In children in whom a diagnosis of tuberculosis was made, 37.5 per cent. showed these enlarged veins and three-fourths were unilateral. Of the children showing signs of latent tuberculosis, 25 per cent. had enlarged thoracic veins.

The cervical glands were swollen in 67.8 per cent. of the children; swollen glands in the axilla, groin, etc., were exceedingly rare. Only one child was found with enlarged supraclavicular glands, and it had other symptoms and signs of tuberculosis.

Hyperplastic conditions of the nose, throat and pharynx, such as enlarged tonsils, adenoids, chronic rhinitis, etc., were found in 58.6 per cent. of the children. Scrofula was rather infrequent. Our investigation tends to confirm the opinion that these hyperplastic conditions, as well as scrofula, have nothing in common with tuberculosis. The external stigmata of tuberculosis, such as scrofuloderma, tuberculides, phlyctenula, glandular blepharitis and conjunctivitis, keratitis, etc., were exceedingly rare among these children.

The cutaneous tuberculin test, applied twice and three times to those who reacted negative to the first application, was found positive in 7 per cent. of infants between one and six months of age. Between six months and one year of age 21 per cent. of the infants reacted positively. The percentage of positive reactions keeps on increasing with advancing age, and at fourteen years 83.79 per cent. were found infected with tuberculosis. When compared with the results obtained by others who reported the application of the tuberculin test to a large number of children, it appears that the tuberculous milieu has not materially increased the number infected with tuberculosis among the children over six years of age. In other cities it was found that about the same percentage, or even more, react positively. But among the infants under four years of age the proportion infected is considerably higher among those who live in a tuberculous milieu. Comparing our results with those obtained in rural districts, where but few consumptives come in contact with the children, we find that children in cities, especially those who live with tuberculous parents, are at a great disadvantage, and that infection is inevitable among them.

Among the 692 children, 65 were found to be suffering from active tuberculosis. Of these, 13 had tuberculosis of the bones and joints, 4 Pott's disease, 2 spina ventosa, and one tuberculosis of the glands. With active pulmonary tuberculosis, 19 children were found, and 25 with tracheo-bronchial adenitis.

The mortality of children under fourteen among these families was rather high. Of 188 children under six that died, 30 succumbed to meningitis, *i.e.*, 16 per cent. of all the deaths of children under six years of age were due to meningitis, which is enormous when compared with the 2 per cent. of deaths due to this cause among the general population. While only 17, or 7.3 per cent., of all the deaths were said by the mothers to have been due to pulmonary tuberculosis, it must be borne in mind that in 79 cases the parents stated that the deaths were due to unknown causes. Many of these were undoubtedly due to tuberculosis, which, during infancy, is not always diagnosed.

The opinion entertained by many authors that infants under one year of age when infected by tuberculosis do not survive the disease is only partly supported by our investigation. We have seen among these children many who were undoubtedly infected during the first few months of their existence, yet they survived and even present a healthy appearance. However, it appears from our observations of the child in tuberculous milieu that the prognosis depends largely on the age at which infection takes place, and that the danger of tuberculosis as a fatal disease among children is in an inverse ratio to the age at which they are infected. Those infected during the first two years of life are in grave danger of succumbing to hematogenous tuberculosis, notably tuberculous meningitis. Children over five years of age, when infected, show only signs of latent tuberculosis, and chronic phthisis is rather rare among them.

Massive infection, such as we found among these children, is the most potent factor in the propagation of tuberculosis. Prophylactic measures taken against the spread of tuberculosis, to be effective, must be directed with a view of protection of infants against any contact with tuberculous persons, and older children against massive infections such as have been met with in the families we found living in a tuberculous milieu.

1337 Madison Avenue.

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held January 8, 1914.

GODFREY R. PISEK, M.D., IN THE CHAIR.

A CASE OF HEREDITARY LUES

DR. SARA WELT-KAKELS presented this patient, an infant six and one-half weeks of age. The parents were apparently perfectly healthy and had been married three years. The first pregnancy resulted in a still birth, the second in a child that, according to the statement of the mother, died of asphyxia at the time of birth, and the third in the infant presented, which was born at full term and was not asphyxiated. The child seemed to be perfectly normal until it was two weeks old, when an eruption appeared and spread over the entire body. The palms of the hands and the soles of the feet were involved. There was a crusty bleeding eruption of the nose and mouth, and breathing was difficult. The organs of the thorax were normal. The liver and spleen were enlarged. The urine contained a considerable amount of albumin. The Noguchi modification of the Wassermann test was positive. Smears taken from the blebs of the planta pedis showed the presence of the spirocheta pallida; the examination of the blood of the apparently healthy mother showed a positive Wassermann.

The rule for the administration of salvarsan in these cases was about 4 mgs. per pound of weight. Dr. Welt-Kakels said that it was her custom to treat such children with bichlorid in small doses. This treatment had not been followed by any bad after effects. The dose was 1 mg., and usually not more than six or eight doses were given.

DR. HENRY KOPLIK said that he wished to say one word in regard to the treatment in these cases of hereditary lues. Many of these children when treated with salvarsan or neosalvarsan died. It was difficult in the newborn to gauge the exact dose and many infants did not bear salvarsan well. In his hospital work he did not use it. He obtained excellent results with calomel and iron. He did not favor the hypodermic use of mercury.

Dr. Thomas S. Southworth assured Dr. Koplik that calomel was used in cases of this kind to some extent in this country. He had long used it in the Babies' Hospital Dispensary, following Dr. Jacobi's method—one-tenth of a grain three times a day. The way in which congenital syphilis cleared up under this treatment, plus mild inunctions, when the babies were at the breast, was remarkable. At the Babies' Hospital Dispensary they very rarely lost a baby from this cause when it was breast fed. He had always wondered that the mortality from hereditary lues was so high as was often given in view of the good results that they had obtained in treating these cases.

In regard to the nasal treatment, he had found that a small amount of oleate of mercury in albolene dropped into the nose had a very beneficial effect on the mucous membrane.

Dr. L. E. La Fétra said that, in cases in which the eruption was intense and the child in bad condition, salvarsan was of the greatest service and would save some babies that otherwise would die; it could be given in one or two injections at an interval of a week or ten days; then mercurial treatment should be used, both by inunctions and internally. It often happened that a patient returned with a relapse of the Wassermann reaction after having been treated with salvarsan alone, and then one had to return to the mercury, so that it was advisable to employ the mercury from the first.

Dr. Godfrey R. Pisek said that in complicated serious conditions, as syphilis complicated by a pneumonia, salvarsan, because of its quick action, would be indicated; but mercury was to be preferred in ordinary cases.

Dr. Welt-Kakels, in closing the discussion, said that in the administration of the bichlorid she did not give it by way of the mouth, but used deep intramuscular injections in the gluteal muscles. One should watch for blood in the feces and for albumin in the urine.

HAIRPIN AND STONE IN BLADDER.

Dr. Sara Welt-Kakels presented an X-ray plate showing the hairpin and stone in the bladder. The patient was a child nine years of age, who had been complaining for two and one-half years. In 1913 she complained of severe pain on urination and of a burning sensation. The urine showed the presence of much pus. but no renal elements. In making an examination per rectum she had felt a resistance and the X-ray revealed the nature of the trouble. The child was taken to the New York Hospital, where she was operated upon with excellent results. The hairpin and stone were removed and the child made a good recovery.

AN EXPERIMENT IN MILK STATIONS.

Dr. S. V. Haas stated that it was his belief that there were two serious errors in the milk stations as constituted. First, the term "Milk Station" was bad because it led the laity to consider milk as the important feature, and cow's milk feeding as the method to be followed, thus subordinating, by innuendo, breast feeding and hygiene. Second, the dispensing of milk was unnecessary either as a premium or as a method of furnishing good milk. For these reasons, as well as from the economic standpoint, it was undesirable for the mother, who was required to go to the distant station for her milk supply, often at a stated time, when it could be equally well obtained near by. The practice of dispensing milk was not desirable for the station since it greatly increased the cost of maintenance by requiring a person to dispense the milk and ice to preserve it. It further deprived the authorities of a method of milk inspection not otherwise possible. If the milk used was purchased in the open market and a child became ill, the source of supply could be at once investigated to determine whether it was of the standard required by the Board of Health.

In order to test these points the following experiment was undertaken. Under the auspices of the Social Service Department and the Pediatric Department of the Lebanon Hospital rooms were set aside in the dispensary building. The Social Service organization furnished a trained nurse as the active head worker, and volunteer assistants. The training school supplied the nurses, who received the social service experience as a part of their course. The Pediatric Department supplied the medical supervision.

The total number of babies that attended the milk station since April 1, 1912, was 455; of these, 384, or 84.4 per cent., were breast fed; 13, or 2.8 per cent., were on mixed feeding; 58, or 12.7 per cent., were artificially fed; 14, or 3.0 per cent., died, 2 dying of malnutrition. The average attendance was 19 infants and the average length of time under observation was 14 weeks.

Dr. Haas summarized his paper as follows:—

(1) These stations should be called "Baby Stations," or some other name not containing the word milk.

(2) Milk should not be dispensed at these stations, because it tended to discourage breast feeding; it placed a burden upon the mother by forcing her to call for the milk, and it deprived the authorities of an obvious method of milk control and materially increased the cost of maintenance.

(4) A "Baby Station" could be successfully conducted without dispensing milk.

(4) Breast-feeding cases were increased by this method.

(5) The mortality statistics compared favorably with those obtained under any other method.

THE INFANTS' MILK STATIONS: THEIR RELATION TO THE PEDIATRIC CLINICS AND TO THE PRIVATE PHYSICIAN.

Dr. S. Josephine Baker read this paper. (See p. 165.)

OBSERVATIONS ON MILK STATION INFANTS.

Dr. Mark S. Reuben read this paper. (See p. 176.)

Dr. Henry Koplik said that he believed in the work of the milk stations and the gouttes de lait consultations and at the same time he recognized the value of the prophylactic work done by the Board of Health. They did ideal work among the well babies. He said that he would not stop to discuss this, but he hoped that it would be allowed to develop.

It would not do to place too much reliance on statistics; many births escaped registration and this altered the value of mortality statistics. They would do well to consider the good work rather than the statistics.

Some of Dr. Reuben's statements he could not accept. He cited one infant of eight months as weighing 30 pounds and another of one year weighing 27 pounds; these were abnormal children and had no place in the paper. Dr. Reuben said that if a baby did not thrive on the breast it should be taken off entirely and fed artificially. The breast should be utilized as far as possible; if the baby took the breast six times a day and did not thrive, one should substitute two feedings, and if even then the baby did not thrive, further feeding should be substituted. Though the child received only two breast feedings daily they should not be given up in early infancy. Again Dr. Reuben advised weaning babies at the age of eight months in two weeks' time. This was too short a time for a baby that was thriving. The weaning should be gradual, extending from the ninth to the eleventh month. One should never take a young infant from the breast while there was any breast milk. The best plan was to utilize all the milk you had and then add the bottle to supplement the deficiency.

Dr. Henry D. Chapin said that there were two points in Dr. Reuben's paper of which he wished to speak. The one was in the line of Dr. Koplik's criticism. Dr. Reuben had said that if after a fair trial there was no gain in weight it was useless to continue trying to use the breast. The State Department of Agriculture had made investigations as to the milk supply of animals and had found that individual animals had their limit as to milk supply and that this could not be greatly altered by feeding and other measures directed toward securing an increase in the supply of milk. If a mother was in fair health and her hygienic conditions were good and diet failed to increase the supply, it was useless to expect much change.

The second point to be considered was in regard to the simple formulæ. A few years ago the formulæ became so complicated and each specialist had his own special formulæ, which no one else could understand or remember and which he was liable to forget himself; now they were going to the other extreme and there was danger of the formulæ becoming too simple; the caloric idea was responsible for this. It was necessary that the food elements should be in the right proportion, and it should be remembered that the food elements were not interchangeable—for instance, that carbohydrates could not be substituted for fats without destroying the proper proportion of the elements. It was to be feared that some of this simple feeding would result in a fine crop of rickets in the future.

Dr. Charles Herrman said that frequently statistics were of little value, but those of the infant mortality as given by the Department of Health during the last few years could be considered accurate. Even if all births were not reported, the percentage reported was very high and had remained quite constant during these years. The important part was that the infant mortality rate had diminished regularly from year to year. In order to obtain a more definite idea of how much an infant welfare station could accomplish, the following experiment was made at the station of the Vanderbilt Clinic. Two square blocks in the immediate vicinity were chosen. The total infant mortality, the mortality from diarrheal disease, from congenital debility, and from respiratory diseases in this area for the years 1907, 1908 and 1909 were known. In 1911 the station was established. It was found that there were 95 babies in these two blocks, but of these only 25 per cent. were registered at the station, although it was so near to the area selected for study. This emphasized the absolute necessity of having a visiting nurse. After the station had been in operation for three years the infant mortality rate in this area could be computed and a comparison of conditions before and after the establishment of the milk station made. In order to obtain the best results there should be a close association between the infant welfare station, the outpatient pediatric department, the babies' ward, and the maternity ward. The last in order to obtain breast milk. At the Lebanon Hospital they were very fortunate in having all four departments together.

DR. THOMAS S. SOUTHWORTH said that he could not quite agree with what Dr. Chapin had said in regard to taking the baby from the breast if it did not thrive after a fair trial. What was a fair trial? Every bit of breast milk that the child could get was of advantage. Many of Dr. Reuben's observations were most true, but when he implied that the breast should be stopped when the child ceases to gain with complementary or supplementary feeding, this was an open question. Dr. Reuben was dealing with dispensary cases and had admitted that the supplementary feedings led to overfeeding and that this was the cause of the failure to get good results in his cases. Where the children were given the supplementary feedings in an intelligent way one could get as good results with them as with entirely artificial feeding. Further, after the age of eight or nine months they were not looking so much for a slightly larger gain in weight as for good, general, well-rounded development.

Dr. L. E. La Fétra said that the experiment carried on by Dr. Hoobler in his Bellevue wards had been very successful, since it was demonstrated that good breast milk could be obtained by such a plan. Breast milk was frequently absolutely necessary to save the lives of premature and feeble infants, and Dr. Hoobler was deserving of much credit for his practical solution of a difficult problem.

The method of making albumin milk with casein flour was easy compared with the older methods, and this was a distinct advantage.

Dr. La Fétra said that he was interested in Dr. Reuben's careful study of infant feeding in dispensary babies. He thought they were all agreed that mothers should be given every encouragement to nurse their babies in whole or in part, and that every ounce of breast milk should be conserved except in those rare instances in which it acted as a poison. This principle should be adhered to not simply because of the greater digestibility of breast milk, but because of the human protective principles that were carried over from the mother's blood.

Dr. William Shannon stated that two years ago Dr. Jacobi, in speaking before the Section, had said that practically all mothers could nurse their infants. This was not so.

Dr. Shannon asked Dr. Baker if it was possible that the cool summer had been to any extent effective in modifying the statistics.

Dr. J. Finley Bell, of Englewood, N. J., said that in Englewood he had succeeded in interesting wealthy people in an effort to obtain mother's milk and that it had worked very well. The cost had been about half as great as that named by Dr. Hoobler.

It seemed to him that the reports of the results attributed to the education of mothers were overdrawn. The mothers were ignorant and unaccustomed to cleanliness, while the making up of a milk formula was rather a technical procedure. It did not seem possible that they could take such a woman and in a few lessons teach her to make up milk formulæ and then to keep the milk properly. This was a factor that should be considered before refusing to give prepared milk to these mothers. It did not seem necessary to jeopardize the lives of the infants in order to educate the mothers. One weak point in the work had been that while the milk was prepared by the milk stations the mother was allowed to take care of the nipples; this was like a surgeon who prepared his hands for an operation and then ran them through his hair. In their work they had cared for the nipples and distributed them covered with waxed paper. They had had from 20 to 30 babies at a time and they had had no cases of spruc and he did not believe that this could be said by the old methods.

Dr. Baker's formula which was passed around called for 280 calories, and this would underfeed a baby of the age for which it was designed.

Dr. Godfrey R. Pisek said that the feeling of antagonism toward the Board of Health's work in this direction had almost gone by and the profession realized that the Health Department was doing efficient and good work and physicians were ready and willing to coöperate with them.

Dr. Mark S. Reuben said that the only reply that he could make to Dr. Koplik was that there was no one who misunderstood like one who would not understand. There was not the slightest evidence to show that those infants fed on simple dilutions did not do as well as when fed on the complicated mixtures so popular a few years ago. The infants weaned at the eighth or ninth month in the manner described, and fed thereafter artificially, were not backward in development. Dr. Reuben said he had expected a "knock" in regard to what he had said about stopping the breast feeding in early infancy. While he did not believe that the infant should be taken from the breast for any trivial reason there were certain cases in which the mother seemed to be in fair health, an analysis of the milk showed that it had the food elements in the right proportion and there was a sufficient quantity, yet the milk was toxic to the child. The child would not thrive while taking the mother's milk, but as soon as it was stopped the infant would do well.

The speaker said that he wished to add his testimony that the success of the milk stations was largely due to the work of the nurses.

Dr. S. Josephine Baker, in closing the discussion, said that Dr. Haas had spoken of the delivery of milk to the homes rather than dispensing it at the milk stations. There was no question but that the milk was a bait to the mothers. The city would be very glad to get rid of the necessity of dispensing milk, but without the milk the mothers would not come to the milk stations. Again, the milk companies would not deliver milk to the homes at the same reduced rate that they furnished it to the milk stations. The "Grade A certified milk" was delivered to the milk stations for eight cents a quart, while if delivered at the homes it would cost fifteen cents a quart. Dr. Baker said she had understood Dr. Haas to say that in his stations about 84 per cent. of the babies were breast fed. This, of course, would eliminate the need of dispensing milk and under such circumstances possibly home delivery might be effectual.

Dr. Reuben should be endorsed in what he had said regarding the simple dilutions of whole milk. They had been using these simple dilutions in the milk stations of the department with very satisfactory results.

In regard to the criticism of the formula on the card passed around as being deficient in calories, it was distinctly stated that this was only a temporary expedient, employed until the infant was thoroughly examined and a formula suited to his individual needs prescribed. These formulæ had been gotten up about five years ago by a committee of which Dr. William P. Northrup was chairman.

As to the statistics of the city, of course they all agreed with the statement that they could not depend entirely on statistics. However, the statistics of Boston, Providence and New York had been accepted by the Federal authorities as reliable; these were the only cities in the United States whose statistics were thus accepted. But even if one discarded the birth registrations entirely the actual numerical decrease in the number of deaths could be depended upon. If the same death rate had prevailed in 1912 that they had in 1907, there would have been about 6,000 more deaths during 1912 than there were. The weather had been pretty much the same throughout the country during the past year. Returns from the other cities had not yet been fully received, but from the figures received earlier in the year it would appear that New York City had a more marked decrease in its infant death rate than any other large city in the country. There seemed to be but one reason for this, and that was the active, systematic work that had been done by all the organizations interested in the reduction of infant mortality.

One of the speakers had questioned the possibility of teaching some mothers the home modification of milk; their experience had shown that this was not only possible but eminently practical. This was a settled proposition, as it had been tried on from 30,000 to 40,000 mothers during the previous year. There was a tendency to overestimate the influence of milk in the problem of infant mortality. Probably 20 per cent. of the mortality could be laid to the milk, while 80 per cent. was due to lack of general care and education.

It should not be forgotten that the good results were due to the excellent service of those doing the work—from the chief inspector to the nurses and assistants. In such work as this one was apt to overlook the work of the individual.

In closing, Dr. Baker invited the physicians to visit the milk stations, to ask questions, and to offer criticisms.

Dr. S. V. Haas said that as an illustration of the value of the nurse to the milk station, he wished to cite an experience at the Vanderbilt Clinic. When the Milk Committee distributed the milk they had an efficient nurse at the station, but they withdrew and the Sheffield Farms people dispensed the milk and had only a person for that purpose and no trained nurse. The attendance at the station fell away rapidly until a nurse was put on service, when it again increased.

Tuberculin Therapy in the Surgical Tuberculosis of Childhood.—Foerster (*Beitr. zur Klin. der Tuberk.*, Vol. XXV., No. 1). When he first began the use of tuberculin in the tuberculous surgical affections of childhood, the writer had attempted, so far as possible, to avoid all reactions. He has found, however, that the best results are obtained from doses that produce a slight local reaction at the site of injection, but just fail to produce a general reaction. He begins with a millionth of a milligram of old tuberculin and increases the dose as rapidly as an avoidance of a general reaction permits. He has found that the best results are obtained in cases that develop a hypersensitiveness to tuberculin; here his results were very good. In cases in which the clinical manifestations are acute, even the smallest doses of tuberculin must be used with caution.—*Interstate Medical Journal.*

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. T. WOOD CLARKE.
DR. CHARLES E. FARR.
DR. HAROLD R. MIXSELL.
DR. MARK S. REUBEN.
DR. J. F. SAMMIS.
DR. S. W. THURBER.

DISEASES OF THE EAR, NOSE AND THROAT.

GREENE, JOSEPH B.: DIAGNOSIS AND TREATMENT OF DIPHTHERIA. (*Annals of Otology, Rhinology and Laryngology,* September, 1913, p. 782.)

The author believes that cultures should be taken in all cases of sore throats in children and urges large doses of antitoxin. In a child seven years old he administered a first dose of 10,000 units, and as the membrane still spread to the structures about the tonsil a second dose of 20,000 units was given, then 40,000, and the same afternoon 20,000 more. Smaller doses were continued for a few days until all signs of membrane had disappeared, and altogether the child had 170,000 units. He states that the temperature may be normal in cases of severe toxemia. A sudden rise suggests otitis media or pneumonia. The peculiar plum color of the pharyngeal mucous membrane is diagnostic before the advent of membrane. A red margin about the edges of the membrane is significant. Diphtheria in the naso-pharynx is liable to be especially severe on account of the lymph absorption. It is also a very contagious variety. The symptoms of laryngeal diphtheria come on slowly and may be simulated very closely by acute laryngitis. The dangers of antitoxin have been grossly exaggerated. In New York over 100,000 patients have been immunized with but one known fatality and that was in a child suffering from status lymphaticus, who died shortly after an injection of but 1,000 units.

Asthmatics, hay-fever subjects and those sensitive to the emanations from horses are liable to have symptoms of anaphylaxis, but adults are more prone to this condition than children. When this condition is suspected a full dose of atropin may be given. Locally, most antiseptics are of doubtful value; warm saline irrigations are the best form of local treatment. Intubation for the laryngeal cases is preferable to tracheotomy.

The following points are emphasized:—

(1) The diagnosis depends primarily on finding the organism. Cultures should be taken of every sore throat and of sus-

picious nasal discharges. If symptoms point toward diphtheria, antitoxin should be promptly administered and that in much larger doses than the text books indicate.

(2) Laryngeal cases require prompt relief from stenosis—first, by large doses of antitoxin, and, secondly, by intubation.

(3) Epidemics are kept up largely by "carriers." They should be sought out and treated. Diseased adenoids and tonsils may require removal before negative cultures can be gotten.

S. W. Thurber.

SURGERY.

Kellock, Thomas H.: Circumcision: The Advantage of a Modified Operation. (*Medical Press and Circular,* December 17, 1913, p. 669.)

A very long prepuce may be said to be abnormal. In correcting it our object should be to convert the abnormal prepuce into a normal one—one that will just come forward over the glans penis and protect it. This is simple if we get away from the idea that the mucous membrane (by this the author refers to the inner layer of the preputial skin) must be trimmed off close to its attachment to the corona. The following operation is recommended:—

"The operation I advocate consists in the removal of only that portion of the prepuce that is redundant. After separating any adhesions there may be round the urethral opening, the prepuce that projects beyond the tip of the glans penis is cut off in slightly slanting direction parallel with the line of the corona; both the skin and mucous membrane are divided at the same level, and no more of the latter than of the former is removed. Then a small incision, including both skin and mucous membrane, about an eighth of an inch long, is made on the dorsum, which converts the round opening into a slightly pear-shaped one. The hemorrhage is generally insignificant, and seldom calls for the use of artery forceps. In quite young babies this is all that is needed; in older children I generally put in four horsehair sutures, uniting the cut edges of skin and mucous membrane, tying them very tightly so that they drop out by themselves after four or five days, so obviating the necessity of their removal, which is a performance painful to the child and irritating to the mother or nurse. If the patient be under an anesthetic, a little tincture of iodin may be painted over the wound, but no application or dressing at all seems as good treatment as any. The dressing of a circumcision is as unnecessary as it is painful to the child; they do much better without any. A small apron of gutta-percha tissue will prevent the diaper sticking to the wound, and more rapid healing takes place in this way than with any form of dressing. The prepuce left in this way should be sufficient to just cover over the glans penis and leave the urethral orifice visible. It can be retracted once a day by the nurse for a week or so, and a drop or two of oil or a little soft vaselin placed on the glans will prevent it becoming sufficiently adherent to the prepuce to make retraction painful." T. Wood Clarke.

Outland, John H., and Logan, Clendening: Myoma of the Stomach. (*Annals of Surgery,* December, 1913, p. 813.)

Tumors of the stomach, other than carcinoma, are very rare. Sarcoma is occasionally seen, but benign growths are very exceptional and for this reason and because the growth occurred in a child this case is doubly interesting. The patient, a boy of nine years, had vomiting spells over a period of two years, accompanied by abdominal pain. Blood was seen in the vomitus on one or two occasions and the boy was weak but had not lost much weight. Examination showed a large mass in the epigastrium and at operation this mass proved to be a tumor of the stomach involving the anterior and posterior walls and projecting into the lumen of the stomach. A two-stage operation was done; gastroenterostomy followed seven months later by partial gastrectomy, about a third of the stomach being removed. The boy made an excellent recovery and gained 12 pounds in two months. The tumor weighed 341 gms. and was 8 cm. long by 6 cm. in width, and occupied the pyloric region and the greater curvature, including the anterior and posterior walls. The serosa and mucosa were intact, the growth arising from the muscular coats. Microscopical examination showed some fibrous tissue, but mostly smooth muscle. Seventy-nine cases in all have been reported, including this case, and of these only 28 have been operated upon or been of clinical interest. Charles E. Farr.

ORTHOPEDIC SURGERY.

WHITBECK, B. H.: THE IMPORTANCE OF THE TREATMENT OF WEAK FEET IN CHILDHOOD. (*Medical Review of Reviews*, 1913, p. 539.)

Whitbeck states that weak foot is continually on the increase and is a very common affection in childhood. Of 2,059 boys at the De Witt Clinton High School 32 per cent. had weak feet, 12 per cent. broken arches. The principal causes of weak feet in children are: (1) Congenital conditions of general weakness or abnormal development. (2) Overweight of the body, causing undue strain on the feet. (3) Prolonged illness or general malnutrition, resulting in muscular weakness. (4) Improper attitudes assumed by children because of these defects or from faulty education or badly constructed shoes.

His conclusions are: (1) Weak foot is the most disabling and widespread of all postural deformities, affecting all classes of societies and occupations. (2) A decidedly large number of cases exist from early childhood. (3) As a result of various causes the feet assume faulty attitudes which, though not necessarily causing disability in childhood, are nevertheless powerful factors for harm in adult life. (4) The proper treatment of this condition in childhood is essential to the prevention of disability in adult life, when interference with occupation is a serious matter.

CHARLES E. FARR.

MEDICINE.

PIERSON, R. H.: POLIOMYELITIS. (*Journal of American Medical Association.*, February 28.)

An epidemic of poliomyelitis in central Alaska is suggestive as regards the epidemiology of the disease, as reported by R. H. Pierson, Fort Gibbon. There were a little over 30 cases altogether, with 4 deaths, and 11 of the cases came under the observation of the Army surgeons at that place. The epidemic among the human subjects was preceded by one of "distemper" among dogs with practically the same symptoms. There is little probability that the disease was brought from the United States, as similar ones had occurred in the same region before with sporadic cases between. The lives of the natives and those of the dogs, which are their only domestic animals, are closely associated and the dogs are ubiquitous, playing with the children and acting as scavengers. The "distemper" is one of several kinds occurring among dogs, especially affecting young animals. When the epidemic occurs, practically all the animals are affected which have not previously had the disease. Pierson gives the history of the epidemics observed by him and says that there was every opportunity, with the habits of the natives, for the infection by direct contact and ample chance for its transmission by flies. There were three kinds of these—a large one, known as the moose-fly, another similar to the common stable-fly, and the house-fly imported from the United States. The reasons for suspecting flies were their abundance about the fishing-camps, the only places where the infection seemed to prevail and to be contracted, and the immunity of the Indians living in other localities. A great many dogs owned by white men had the disease, but no white person suffered, as they were careful in keeping their dogs away from their dwellings, had their houses screened and were generally more cleanly in their habits. The points Pierson brings out in this paper as of interest are the coincident infection of the dogs and the cessation of the epidemic with the first frost, which would suggest insect transmission. While the study of the epidemic was incomplete, it is hoped by him that it may be suggestive and helpful in other epidemics that may occur.

HUTINEL, PROFESSOR: MENINGEAL HEMORRHAGE IN CHILDHOOD. (*Medical Press and Circular,* December 10, 1913, p. 636.)

Meningeal hemorrhage in infancy is far from rare. The more the subject is studied the easier it becomes to recognize the condition. It may occur in the pia mater, either on the convexity, on the cerebellum or extending down the spinal canal. It is most apt to occur in premature infants or debile twins. It is met in newly-born infants, in infants who have become infected and in connection with hemorrhagic states. It may follow strain, and in infants is almost always of venous origin. In most cases the symptomatology is reduced to somnolence and a tendency to coma. Conjugate deviation of eyes and head is less frequent than in cerebral hemorrhage. Epileptiform convulsions, usually Jacksonian, are common. Contracture is usually present, and

Kernig's sign is pretty constant. In older children there may be hemiplegia or monoplegia. The reflexes are exaggerated or lost. There may be amaurosis and incontinence of urine. Vomiting is common. Respiration may be dissociated. The temperature may rise. Lumbar puncture shows a bloody fluid under high pressure. The prognosis is not quite so grave as it used to be, but the forecast as to the child's future must be guarded. Epilepsy is apt to supervene. T. WOOD CLARKE.

BOOT, G. W.: A CASE OF CONGENITAL MYOTONIA. (*Chicago Journal of American Medical Association,* December 20, 1913.)

This seems to be a hereditary condition, the patient's mother and older brother both having the same disorder. The patient, aged twenty-one, was the youngest of three boys. His trouble started at the age of five, when he had difficulty in arising from a sitting to an erect position. Since then he has had numerous falls due to his muscular spasm. At the present writing he is a typical case of Thomsen's disease, his muscles being thrown into a tetanic condition on sudden exertion, the spasms sometimes lasting as long as a minute. Once he overcomes this spasm muscular movement is normal. These spasms may recur whenever voluntary movement is attempted. The author arrives at no definite conclusion in regard to the pathology, treatment or prognosis of this condition, but thinks that the symptoms may be improved by active muscular exercise.

HAROLD R. MIXSELL, M.D.

THERAPEPUTICS.

NICHOLSON, JR., S. T., AND HOGAN, J. F., BALTIMORE: LACTIC ACID IN DIPHTHERIA. (*Journal of American Medical Association,* February 14.)

The authors give the results in 9 cases of the use of lactic-acid-bacilli spray for ridding the nose of diphtheria germs. The results by this method were better than from any other used. Cultures from live lactic bacilli (Bulgarian type) were obtained and a small atomizer was used to distribute the culture in 4 cases. In 5 cases the ordinary sour milk was used as a gargle also. The 9 cases are briefly reported.

WOLFF, M.: THE TREATMENT OF GONORRHEAL VAGINITIS IN CHILDREN WITH AUTOGENOUS VACCINES. (*Chicago Medical Record,* 1913, p. 462.)

Wolff claims to have had excellent results from the use of the autogenous vaccines in the treatment of gonorrheal vaginitis in infants and young children. Cultures are made as follows: Two on plain agar slants, three on human blood, ascitic or hydrocele agar, incubated two days, and prepared in the usual manner. The dosage is from 25,000,000 to 50,000,000, with smaller doses for the very young infants. No local treament is allowed except simple cleanliness. The initial dose is repeated in five to seven days and continued thus for six weeks. At the end of this time, if the smears are still positive, a second vaccine is prepared in a manner similar to the first. Smears are examined regularly every week after the first fortnight. Of the 40 cases treated only 1 has relapsed so far as known. Three negative smears, a week apart, was considered a cure. The average number of injections was seven. Wolff claims 100 per cent. cures for the method. It is interesting, in this respect, to compare his results with those of Barnett in a recent number of the ARCHIVES OF PEDIATRICS. The latter found no benefit at all from the vaccines except in the complications. CHARLES E. FARR.

INFANT FEEDING.

INFANTS' WELFARE STATIONS IN NEW YORK STATE. (*Monthly Bulletin, New York State Department of Health,* December, 1913.)

On June 12, 1913, the first State Conference on Infant Welfare was called for the purpose of considering methods for the reduction of infant mortality in this State.

The department has kept in touch with all the milk stations established by means of monthly reports. A compilation of these reports is given which prove that this work is the most important factor in reducing infant mortality, and the State Department of Health is anxious that these activities be extended and offers its aid whenever possible.

There are eleven cities and one village in the State, excluding New York City, where infant milk stations have been established. The total number of milk stations is thirty-two, and, on August 31st, 3,231 babies under two years were enrolled at them.

While the stations are usually called "infants' milk stations," a more descriptive name would be infant welfare stations, although the sale of milk undoubtedly attracts many mothers that would not otherwise come. The following suggestions are offered for the organization of infant welfare stations:—

In some cities the stations are supported by municipal funds, but where this is not possible a committee is formed, who raise the necessary money and manage the work. A medical director is appointed who has direct charge of the work. The staff consists of at least one nurse for each station and several volunteer physicians, who have charge of the weekly clinics. The station should be located as near as possible to the center of the district it is to serve. A study of the location of infant deaths in a city will show better than any other method where a station had best be placed. Two rooms at least are necessary for the station—a room for dispensing the milk and a consultation room, which is used also for weighing the babies and demonstrating the modification of milk to the mothers.

Two records are indispensable—the registration card and the monthly report form.

A separate fund should be established as the Relief Fund. Literature should be printed often in several languages for distribution amongst the mothers. J. F. SAMMIS.

BOOK REVIEWS

CASE HISTORIES IN PEDIATRICS. By JOHN LOVETT MORSE, A.M., M.D., Associate Professor of Pediatrics, Harvard Medical School; Associate Visiting Physician at the Infants' Hospital and at the Children's Hospital. Second edition. Boston: W. M. Leonard, publisher, 1913.

The second edition of Professor Morse's book is an even more valuable work than the first, and an addition to the Case History Series, which includes the subjects of Medicine, Surgery, Neurology and Pediatrics. It is a lengthy book of over six hundred pages and covers 200 cases—about twice as many as the first edition. The case system of teaching has been in vogue at the Harvard Medical School since 1900, and has been found to be far superior to recitations, quizzes and conferences; and almost as valuable as clinical lectures in which the patient is presented. Except in special instances it has certainly proved more instructive than simple didactic lectures. It is with this view in mind that the cases have been worked out. The book itself is attractively bound and is printed in large, readable type with numerous illustrations. The first section, on the "Normal Development and Physical Examination of Infants and Children," is concisely written and emphasizes many important points in diagnosis. The cases following, 200 in number, ranging all the way from "Diseases of the Newborn" to "Unclassified Diseases," are presented as they actually occurred, and are all problems to be solved by the reader. Diagnosis and Prognosis, in all but a few cases, were confirmed by the author. The treatment recommended was that actually employed. The hypercritical, perhaps, could pick minor flaws in the author's reasoning, or might disagree with the treatment of some of his cases, but on the whole we have here a book which will be well received by the general practitioner as well as the pediatrist.

HAROLD R. MIXSELL, M.D.

THE PRACTICE OF PEDIATRICS. By CHARLES GOMOX KERLEY, Professor of Diseases of Children in the New York Polyclinic Medical School and Hospital; Attending Physician to the New York Nursery and Child's Hospital; Assistant Attending Physician to the Babies' Hospital; Consulting Physician to the Sevilla Home for Girls and to the New York Home for Destitute and Crippled Children, etc.; Ex-President American Pediatric Society; Ex-President New York County Medical Society. Pp. 878. Illustrated. Philadelphia and London: W. B. Saunders Company, 1914.

This book is an enlarged and revised form of Dr. Kerley's earlier work, "The Treatment of Diseases of Children," published first in 1907 and since appearing in several editions. Dr. Kerley has been importuned frequently to make this book larger and more comprehensive and to include etiology, pathology and diagnosis as well as treatment. His earlier work being intended to be an intensely practical book, so to speak (to borrow from Dan Beard) a "Pediatrist's Handy Book, or What to do and How to do it," did not cover these aspects of pediatric problems. The present volume attempts and succeeds in so doing. It is impressive in size, well made in every respect, has a legible, attractive type page, and is illustrated by remarkably good illustrations, of which a color plate of a brain with pneumococcus meningitis deserves especial mention. The book is frankly a "one man book"; that is, the conclusions drawn and the attitudes taken are in the last analysis those from Dr. Kerley's personal experience. Little attempt has been made to see whether these agree with the general experience of the pediatrists of the world. The book, therefore, loses in certain respects, while it gains in others. It has not an encyclopedic character and therefore would not be the most suitable book for a medical student to study pediatrics from; but for the practitioner whose desire it is to refer his problems to a teacher of great experience and to know how such a master makes his diagnosis and treats his cases—to have, in short, a consultation with Dr. Kerley—the volume is invaluable. The introduction of illustrative case histories, drawn from a large private practice, adds to the general readability of the book, which is high and to which the personal touch just mentioned contributes a large share.

Among the many excellent chapters we note the continuation of the chapter on gymnastic therapeutics and the index of drugs and dosage, and general therapeutic procedures. In the chapter on feeding we note the continuation of cream-milk formulas and the advising of two-hour intervals in feeding, with the insistence on the difficulty of proteid digestion. The calorimetric idea is dismissed with scant ceremony as of little help, which may well be the case with one of Dr. Kerley's great practical experience. The arguments against it, however, based on children who have gained when fed more than their caloric requirements, seem not quite convincing. More on the rôle of the salts in infant metabolism would have been welcome. This volume details at length the methods which Dr. Kerley uses in the care of the recurrent cases of bronchitis, cyclic vomiting, asthmatic bronchitis, urticaria, etc., methods which are unique with him and with which he has had unique success. The chapter on Tetany is a particularly well-written and up-to-date section. In fact, throughout, the spirit is one of wholesome conservatism enlivened by passages of much originality.

We predict that this book will be soon in the "best seller" class.

ARCHIVES OF PEDIATRICS

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EDITORIAL

VACCINATION AGAINST SMALL-POX.

"When the Devil was sick, the Devil a saint would be.
When the Devil was well, the devil a saint was he!"—

which expresses truly, if not elegantly, the attitude of the public and of far too many physicians toward small-pox and vaccination.

How many physicians know what small-pox meant to our ancestors, to our great-grandfathers, even? Not as many as should, certainly, or there would not be so many unvaccinated persons going around in the community, continually menacing the general health. To us, except occasionally, small-pox has no personal appeal. Lots of us have never seen a case. We have taken for granted the teachings of our medical schools and text-books that vaccination protects against small-pox; and we are willing to admit that our freedom from the disease is due to the custom of universal vaccination; we are willing to submit to be vaccinated ourselves, and to vaccinate children when their parents want it done prior to entrance into school. But many of us do not know how conditions have changed, have no mental picture of the state of affairs in pre-Jennerian times. It is news to such that small-pox, unmodified, is a disease of childhood—part of the pediatrist's work—that children under ten years of age used to contribute as high as 993 per 1,000 deaths from this disease, and that in one instance, out of 25,349 deaths from small-pox, 21,078 were in children under five years old. So certainly did every one have the "pock disease" that in a certain English village, where, after the epidemic of 1722, there were only 302 persons who had not had small-pox, all of these 302 were tabulated *"to have* small-pox." About every four years there was an epidemic, and the patients in that epidemic were almost entirely the children who had been born since the height of the previous epidemic, or, at most, since the second previous. Often, nine out of ten of the victims of such an epidemic were the children of the first class; while of persons over twenty years not 1 in 200 deaths could be attributed to them. Not today's picture, certainly.

The physician of today may know, hazily, that small-pox is a deadly disease, but he is amazed and horrified to learn that in the eighteenth century in Europe 50,000,000 persons died of small-pox; that of the total number of deaths from all causes, small-pox contributed on the average as high as 16 per cent. In epidemic years the total death rate, for which small-pox was responsible for nearly 50 per cent., exceeded sometimes the total birth rate. During an epidemic in Iceland in 1707-1709, out of a total population of 50,000, 18,000 persons died from small-pox. These are chance statements, but typical of the state of affairs then existing—a state of affairs that had no relief until Jenner introduced vaccination in 1796.

In that year, in London, small-pox was causing 184 out of every 1,000 deaths from all causes. In 1909 in our registration area, small-pox caused but 1 in every 10,000 deaths; in New York City about 1 in 20,000. Quite a difference! Where one person dies now from this disease, in the London of 1796, 3,680 persons would have died.

This change has been accomplished by vaccination, not by increased excellence of sanitation. For now, under the same sanitary circumstances, the vaccinated, especially if recently vaccinated, are almost 100 per cent. immune, while the unvaccinated are uniformly infected when exposed, and their death rate runs from 30 to 50 per cent. as against 2 to 6 per cent. for persons who have ever been vaccinated, no matter how poorly it was done or how long ago. Nor has the disease changed its severity. In five years in the nineties, 275,502 persons died from small-pox in Russia. If any factor besides the actual vaccination of an individual seems to protect him against an attack, it is the rearing about him a wall of vaccinated and therefore protected individuals, creating a community where the disease finds scant foothold.

Better than vaccination is compulsory vaccination, and compulsory *re*vaccination. By means of the latter did Prussia lower the death rate to 1 per 5,000,000 inhabitants among the civil population, while among the military population, where since 1834 this has been the rule, except in epidemic years, there are *no* deaths from small-pox.

Niagara Falls has been going through an epidemic this winter of proportions so large that if it had occurred among a population the size of New York City there would have been 65,000 cases. This epidemic arose in spite of the growth of sanitation, simply because a misguided fanatic writing anti-vaccination literature had turned the tide of public sentiment away from vaccination and the community was bone-dry timber for the conflagration that started.

We have not yet arrived at the stage where the people at large are willing to cease restlessly pursuing the *ignis fatuus* of "personal liberty" and rest securely in the steadier beam of "communal benefit." When this happens, as it must, vaccination against small-pox will need no protagonist.

It needs none now beyond the facts, absolutely convincing to the open mind; but the facts need utterance and we physicians should realize our duty to urge vaccination and revaccination with all our might. At any time, wherever the custom has lapsed, as it did in Montreal in the nineteenth century, and in Niagara Falls in this, the fourteenth year of the twentieth century, the old horrors may recur.

Ours is the responsibility; let ours be also the eternal vigilance which is the price of liberty.

ORIGINAL COMMUNICATIONS

MALARIA IN INFANTS.

BY WM. WESTON, M.D.,
Columbia, S. C.

Before I commenced the preparation of this paper I took occasion to make a fairly thorough examination of the literature on the subject of malaria in infants. I was surprised at the meagerness of the supply, as applied solely to infants. The subject seems to have escaped the attention its importance entitles it to.

Even a superficial examination of the subject cannot but impress one with the tremendous rôle the disease plays in the morbidity and mortality of infants wherever the disease prevails endemically.

I know of no disease that approaches malaria in historic interest. The part it has played in the economic and social conditions of various peoples, its effects upon the progress of civilization, and even in the termination of great wars, are matters that have long since been accepted. From time to time statesmen and physicians have coöperated in an effort to solve some of its problems. At one time malaria was prevalent in England, and such historic characters as James I. and Cromwell are said to have died of it. There, by the coöperation alluded to and by careful and systematic drainage, England has been freed from it.

Napoleon keenly realized its importance in relation to armies. Lee invariably allowed the enemy to cross certain rivers along whose swamps malaria was endemic and then halted them in protracted battle. I cannot but believe that he was well aware of what a valuable ally he had in malaria when in the ranks of the enemy.

The part it has played in the destiny of great nations is a matter of common knowledge. It is supposed that malaria was the underlying cause of the fall of both the Greek and Roman nations. It is a noteworthy fact that certain sections of the South, once noted for the brilliance and chivalry of its men and for the grace and beauty of its women, where wealth and culture once abounded, are now scarcely inhabited at all, and this condition can only be attributed to the terrible ravages of malaria.

Wherever malaria exists endemically the birth rate is low and the infant mortality rate is excessive.

I know of no greater tribute to the importance of a disease than that out of the eight Nobel prizes thus far awarded two of them have been awarded to men for discoveries in malaria—Ross in 1902 and Laveran in 1907.

In the brief scope of this paper I shall necessarily have to omit much interesting and important matter, and shall only include such facts as are directly relevant to the more restricted subject selected.

It is a universally accepted fact that in localities where malaria is endemic abortion or premature labor is the expected result of a malarial paroxysm. The mortality rate, as you know, is very high in premature infants, even when the mother is in a comparatively normal condition and can furnish sufficient milk of good quality. Infants born at full term of malaria-infected mothers are below the standard in both weight and height, are generally weak, have poor resisting power, and from insufficient nourishment often die of inanition. The mortality rate in infants infected with malaria is exceedingly heavy. Thornhill, in the *Indian Medical Gazette* of March, 1898, says: "In Ceylon during 1896 40 to 50 per cent. of the children dying under one year of age died of convulsions, most of which were due to malaria."

Travers, writing of malaria in British Malaya says: "I know of one estate (since abandoned) on which a large Tamil labor force was employed where all the infants died. The manager offered a reward for the first child successfully reared on the estate, but that reward, I believe, was never claimed."

I was deeply impressed when a boy living on a large cotton plantation that one September nearly all the negro babies on the plantation died of pernicious malaria.

A few years ago many families were brought from middle and East Tennessee to a recently finished cotton mill, which was situated near a swamp in a certain Southern State. Among these people were many infants. Within three months nearly half had died, as a result of pernicious malaria.

Laveran, quoting LeBrun, says of 2,073 cases of malaria observed at Beirut, 1,065 were children under eight years of age. Of the predisposing etiological factors of malaria I feel that it is not an extravagant assertion to say that perhaps age next to location is the most important. When a family moves into a malarial district the infant is invariably the first infected and the most seriously affected of the family. This is due to the fact that they are helpless against mosquitoes, they sleep longer and the sleep is more profound; their tender skins, their manner of dress makes them an inviting field for attack.

It is claimed by several authorities that when the infant survives it may have latent malaria over a long period of time without manifesting any symptoms of the disease save anemia. Of the whole family the infant is usually the one that harbors the parasites for a long period of time, and is therefore the focus from which the disease spreads.

Locality is a very important etiological factor. We have known for many years that low-lying, swampy districts were hotbeds of malaria, but not until comparatively recently did we know that the anopheles mosquito was to be found in high altitudes. We now know that malaria can exist wherever the anopheles can breed, regardless of the altitude.

Dr. W. B. W. Howe, in the November number of the *Southern Medical Journal,* reports cases at Hendersonville, N. C., in people who had never been out of the mountain districts. The altitude of Hendersonville is about 2,200 feet above sea level. We are all probably aware of conditions as reported from the Philippine Islands, where malaria sometimes exists high up in the mountains and none in the valley below. Wherever it is found, either epidemically or endemically, there must be the anopheles mosquito and stagnant water, whether the latter exists in a swamp or in a tin can.

Seasons.—In the Southern States malaria reaches its height in July, August and September. However, along the South Atlantic Seaboard and the Gulf Coast it often prevails throughout the year. A very rainy spring or summer is generally followed by much malaria in endemic areas. The pernicious types are most often seen in the early autumn. The convulsive pernicious type is most apt to attack infants with nervous pre-disposition, either hereditary or acquired.

In infants there exists no race immunity, and the sexes are equally susceptible to infection.

It is a well-known fact that the anopheles bites at night.

It is still a mooted question as to whether there is such a thing as congenital malaria.

The exciting cause are the plasmodium vivax, or tertian parasite; plasmodium malariæ, or quartan parasite; the precox, or estivo-autumnal parasite. The estivo-autumnal parasite appears in two forms—the tertian and quotidian.

The tertian variety is the most frequently seen, and, like the quartan, is often less serious than the estivo-autumnal. I think the quartan is the least frequently seen in the South of any variety.

These parasites are carried by certain forms of mosquito, belonging to the genus anopheles. The disease can also be produced by injecting the parasites into the circulation.

All forms find lodgment in the red cells. It may be of interest here to state that Bass, of New Orleans, has succeeded in growing the parasites in artificial media.

Pernicious malaria, to which infants are so subject, is merely an intensified degree of the infection, and not a pathological entity. It may be caused by either the tertian, quartan or estivo-autumnal parasite, most frequently, however, by the estivo-autumnal variety. They may be primary attacks, or they may occur in cachectics. I am well aware that several authorities, men for whose opinion I have great respect, deny that either tertian or quartan parasite produces pernicious malaria, or that it is ever primary. I recall 2 cases of pernicious malaria in white infants which were primary infections by the tertian parasite. Both infants were previously in excellent health; one lived nine hours after the onset of the attack, the other only about six hours. In both cases convulsions were almost continuous, and the temperature high. In both of these cases the parasites were found in great numbers in the peripheral circulation.

It is usual in cases of pernicious malaria in infants coming to autopsy to find great hordes of the parasites in the brain, which accounts for the frequency of convulsions. The infantile nervous system is a most important predisposing factor, being peculiarly responsive to malarial toxemia.

Latency and relapses, which are so often seen in children in the second and third year, can only be satisfactorily explained by parthenogenesis.

I have never heard of a case of malarial hemoglobinuric fever in an infant.

Symptoms.—The incubation period is not very definite, being dependent upon several factors. It is, however, relatively short, perhaps not over three to five days, and may be shorter.

The classification of malarial fevers in infants is more or less arbitrary, and only for the sake of convenience I have chosen to classify them from an etiological standpoint.

In tertian malaria the paroxysms of fever occur every forty-eight hours and are due to the segmentation of the tertian parasite. The quartan paroxysms occur every seventy-two hours. It must be remembered that in either type there may be successive infections at different periods, which, while not affecting the period of segmentation of the first infection, may confuse by the attacks occurring daily. The different stages in infants are not well marked, as they are in older children or adults.

The attack usually begins abruptly by vomiting or convulsive twitchings, often both, or often the convulsions are well marked, the eyes are often rolled back in the orbits, and the conjunctiva congested, the skin at first assumes an ashy hue, the lips are very pale or almost blue, the finger tips and toes become cyanotic; this stage is often followed by reddening of the surface; especially do the cheeks become congested, while the nose, in contrast, is white and pinched. The temperature from the first rises rapidly, often going to 105° or over; the pulse is rapid, and may be either full and bounding or weak and intermittent. As the paroxysm begins to subside, perspiration appears, first on the forehead, then over the entire surface, and the temperature falls, and the baby goes into a profound sleep, awakening after several hours much prostrated. Herpes often appears after several hours around the lips.

Infection by the estivo-autumnal parasite is almost invariably severe. Continued convulsions and high temperature are the rule, often followed by death. If infants survive the first attacks of either of the infections, the following paroxysms are less severe.

There may be light infections by the tertian or quartan parasite, which may so mask the true condition that diagnosis becomes difficult. In these cases the temperature may or may not go high, the child seems fretful and loss of appetite marked, but thirst great.

Special Symptoms.—The spleen rapidly enlarges, and the liver is usually enlarged. The skin is usually more or less jaundiced. The gastrointestinal manifestations are: loss of appetite, often vomiting of food which has previously agreed with it. Either obstinate constipation or diarrhea may follow an attack.

A heavily-coated tongue is the rule. Acute pulmonary congestion is sometimes seen, and may be so marked that with the high temperature and rapid pulse and respiration a diagnosis of pneumonia may easily be made. Cachexia is often marked.

Diagnosis.—A positive diagnosis can usually be made by examining a specimen of blood taken at the beginning of the paroxysm and before quinin has been administered. It is most important that the specimen be taken for examination before any quinin is administered, as even a very small dose will probably cause the parasites to disappear from the peripheral circulation. While it is usual to find the parasite under proper conditions, failure to find them, even by an experienced microscopist with a properly prepared slide may not preclude the possibility of malaria, as the parasites may be absent from the peripheral circulation, they being massed in the brain, spleen or liver.

The finding of melanin in the large mononuclear leukocytes is said to be pathognomonic of malaria, but more diagnostic of chronic than acute malaria.

The therapeutic test of administering quinin is valuable. The clinical symptoms, especially the periodicities of the tertian and quartan varieties, may be a very valuable aid in making a diagnosis. There are many diseases that may be mistaken for malaria. Among the most frequent are pyelitis, septicemia, pyemia, bronchopneumonia and acute indigestion.

Physicians in the South have in the past been too prone to ascribe indefinite or obscure symptoms arising from various disorders or diseases to malaria.

Prognosis.—The mortality rate in infants is high, and especially so if it be infection by the estivo-autumnal parasite. Should they survive the first paroxysm and proper treatment be promptly instituted the outlook is not so unfavorable, although it must be remembered that malaria so undermines the constitution that they often fall victims to some intercurrent disease.

Treatment.—No disease offers more brilliant opportunities for preventive measures than does malaria. All houses in endemic areas should be thoroughly screened. The breeding places of mosquitoes near residences should be sought for and when found either destroyed or treated by spraying crude petroleum over the water.

Patients infected should be treated so as to destroy the focus. Children living in endemic areas should be required to be indoors before sunset, and when asleep should, even in a screened house, be carefully covered over with a closely-meshed net. Another valuable remedy is anointing the exposed parts with oil of citronella.

If seen during the early part of the paroxysm give a hot mustard bath, apply an ice cap to the head, and if the infant is having convulsions give bromid of soda and antipyrin also. If the infant is in this stage frequent tepid spongings give great relief. The bowels should be promptly and freely opened by the use of frequent small doses of calomel. Other medicinal treatment consists in the administration of quinin, preferably bisulphate in aqueous solution. It must be borne in mind that the stomach of infants suffering from malaria is almost invariably very irritable, often vomiting even water, and it is therefore very important that it should only be given at those times when it will be most effective in destroying the parasites. I would, therefore, advise that in benign attacks no quinin be administered for at least three hours after the temperature becomes normal. Then administer 2 grains bisulphate in aqueous solution every two hours day and night for twenty-four hours, then 2 grains of the solution every four hours for twenty-four hours, then 3 grains morning and evening for three weeks. It absorbs more readily when the stomach is empty. If difficulty is found in retaining the bisulphate, eu-quinin or the tannate may be tried.

In pernicious malaria it is useless to try to administer quinin by the mouth, and its hypodermic use is the only method to be relied upon. The best salt of quinin for injection is the bimuriate. The tablets of bimuriate of quinin and urea are convenient and reliable. The 3 grain tablets contain about 2½ grains of the quinin salt. The tablet should be dissolved in distilled water or merely sterilized water. The needle and syringe must be sterile and the skin sterilized. The solution is then injected deep into the muscles. This procedure may be repeated every six hours.

Finally the rectal administration of quinin may be resorted to. Here the bimuriate in doses three times as large as would be given by the mouth or intramuscularly should be given in 2 ounces of warm water. This injection should be given high up in the rectum. It is well to add 5 drops of tincture of opium to the solution to prevent tenesmus and aid retention.

CONGENITAL MALARIA.*

BY MURRAY H. BASS, M.D.,
New York City.

The question whether malarial infection can be transmitted during pregnancy or labor from mother to fetus in utero is one which has aroused considerable interest. Reports of cases and of pathological work have appeared during the past two decades, some affirming, others denying, the possibility of such intra-uterine infection. Chiefly owing to the fact that many of the so-called congenital cases have been so classified without sufficient proof that avenues of post-natal infection have been excluded, the consensus of opinion has been that malaria is probably not transmitted in utero. This conclusion, moreover, has been strengthened by the pathological findings of numerous observers, among whom may be mentioned Thayer, Pezopoulos and Cardamatis, Marchiafava and Bignami, who failed to find parasites in the fetal blood, in the cord or on the fetal surface of the placenta, although at the time of labor the maternal blood contained numerous plasmodia. However, during the past few years, a small number of cases reported by competent observers seem to offer incontestable proof that though a rare occurrence, malaria may be transmitted antenatally from mother to offspring.

It is not my purpose to review fully the literature of the subject, as this has recently been done in this country in the papers of F. S. Meara (ARCHIVES OF PEDIATRICS) and of F. Beekel (*Cleveland Medical Journal*) which appeared in July, 1909, and in November, 1910, respectively. The reader interested in the subject is referred to these papers for the discussion of the question prior to 1910.

Meara reports the case of an infant born in the middle of October at Massapequa, L. I. The mother and father of the child had both suffered from malaria in August, but had been apparently cured by quinin in the course of a few weeks. The baby appeared well at birth and remained so for ten days, when it appeared ill and began to lose in weight. When aged seven weeks it was admitted to Bellevue Hospital, where in a routine examination the blood was found loaded with malarial organisms. The mother's blood at this time also showed the presence of parasites. The child died in spite of vigorous quinin medication.

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* Read before the Pediatric Section of the New York Academy of Medicine, February 12, 1914.

Meara, from a careful consideration of the evidence offered in the literature, seems inclined to doubt the occurrence of intrauterine infection and evidently does not consider his own case as a completely proven one.

Beekel's case, one of quartan malaria in a ten-weeks' old infant, born the end of September, cannot definitely be attributed to an intrauterine infection, on account of the time elapsing before the child showed symptoms and on account of the absence of any history of recent malarial infection in the mother. Beekel, however, in a thorough search of the literature has been able to collect 11 cases which seem to be absolutely proven. These cases are as follows: Duchek (1); Crandall (1); Hitté (2); Economos (7). In Crandall's case the infant had a paroxysm when eighteen hours old, though plasmodia were not found until the third day of life. In Hitté's cases observed in Algiers, plasmodia were found in the blood from the umbilical cord. Economos reports 7 cases from Sparta, in 5 of which he found plasmodia in the fetal blood at times varying from eight to forty-eight hours after birth. He was led to look for the plasmodia owing to the fact that he so often noted very young infants suffering from malaria in midwinter, when transmission by means of the mosquito was extremely improbable. His reports are absolutely convincing and, though differing from those of almost all of the previous investigators, gain in importance from the fact that since their publication several other similar observations have been made by other physicians.

In 1909 Dumollard and Viallet report the following case: A woman seven months pregnant was attacked by a severe type of malaria for which she was admitted to a hospital. In spite of large doses of quinin her fever continued and in a precipitate labor she gave birth to a child which lived but one hour. The placental blood, the blood from the cord, and the heart blood of the infant all showed numerous plasmodia of the same type as those in the maternal blood. The labor had not been attended by hemorrhage.

In a thesis written in 1910 on the subject of "Congenital and Hereditary Paludism," A. Laffont reviews the whole subject very thoroughly and adds a new case of undoubted congenital infection to the foregoing. Among his conclusions may be mentioned the following: "The parasite may be transmitted from mother to fetus. The rebellious types are not always those transmitted, for benign types may also be transmitted. Hereditary malaria may be divided into (1) congenital malaria, which occurs in the embryo or fetus, and (2) true hereditary malaria, which attacks the fetus or embryo but which develops in the new-born, the child, or the adult. The hereditary early type of malaria of the new-born may be (*a*) acute, (*b*) chronic, (*c*) latent. The diagnosis of the last can be made only by means of the microscope. The latent form of hereditary malaria may not show itself by frank attacks until several months later; this explains the occurrence of a late hereditary malaria of which there has not yet appeared an absolutely convincing case."

The most recently-reported case is that of Tissier and Brumpt, who in February, 1913, describe the following: A woman pregnant in Algiers had an attack of malaria in January (plasmodium vivax found in the blood). For this reason she moved to Neuilly, France. In May, when about five months pregnant, chills recurred and were very severe. However, under the administration of quinin she became apparently well, and remained so. In October she had a normal, very easy, labor, and was delivered of an apparently perfectly healthy child. When nineteen days old the infant developed fever of a tertian type which led to the diagnosis of malaria, which was corroborated by finding the plasmodia (p. vivax) in the blood. The authors state that it is out of the question that the child was infected after birth, since malaria and mosquitoes are unknown at Neuilly in October. They believe that the infection occurred either at birth or in utero, and that the nineteen days which elapsed before symptoms appeared are to be regarded as a period of incubation.

To these reports I wish to add the following case, seen at Dr. Hill's Maternity Clinic in the Pediatric Department of Dr. Herman Schwarz, to whom I here wish to express my thanks for permission to observe the case and publish it.

On February 19, 1913, there was brought to the clinic a baby, Anna C., aged seven and one-half weeks, of Irish parentage.

The mother stated that since about three weeks she had noticed that the baby was fretful, had numerous green stools, vomited occasionally and had been losing in weight. She had noticed no fever. Feeding had been part breast and part a bottle containing a weak Imperial Granum mixture.

Examination of the baby revealed a pale, emaciated infant weighing 6 pounds, 1 ounce. Though at times it seemed bright and interested in its surroundings, at others it appeared dazed and almost semi-comatose. Lymph-nodes all slightly enlarged. Heart and lungs negative. Abdomen slightly distended but lax. Liver felt one finger below the free border of the ribs; spleen two fingers below free border. Otherwise examination was negative. Stool passed by infant while being examined was green, thin and contained much mucus.

The striking fact in the examination being the child's extreme pallor, a hemoglobin test was roughly made with the Talquist scale which showed a hemoglobin index of between 10 and 20 per cent. As a result of this a spread was taken and immediately examined under the microscope, when greatly to our surprise large numbers of plasmodia of the tertian type were seen in the red cells. So numerous were these that although, owing to the extreme anemia, there were relatively few cells in the miscroscopic field at one time, there were four or five parasites to be seen in the same microscopic field.

The mother was then more closely questioned and the following interesting history obtained: She is twenty-six years of age, and was in perfect health until the time of her marriage, which took place in December, 1911. Previously she had lived in Long Island, but at the time of her marriage moved to New York City, which place she had not left since. In August, 1912, when about five months pregnant, she began to feel ill and had frequent attacks of fever occurring on alternate days. She paid little attention to these attacks until one day, after she had had them for about one month, while walking on the street she was seized with a chill so severe in character that she was carried into a physician's office. He examined a drop of her blood, told her she was suffering from malaria and prescribed a medicine which she says she took for a few days. From that time on her chills stopped, and she had consulted no physician.

On December 23d her baby was born after an easy labor unaccompanied by hemorrhage. This was ascertained from the records of the Maternity Clinic by whose physicians she was delivered. She had noticed nothing wrong with the child until it was about one month old, when, as was stated above, it began to appear ill.

As a result of obtaining this history, the mother's blood was examined. It showed 96 per cent. hemoglobin, a normal cell count and a normal differential count and no plasmodia. Physical examination, however, revealed an enlarged hard spleen, felt about two fingers below the costal margin.

The subsequent history of the baby is as follows: The blood was first examined at 3:30 P.M., when the temperature was normal, and great numbers of fully-developed plasmodia were seen. The child was therefore kept at the clinic and its temperature was frequently taken during the next few hours to ascertain whether a rise would occur. At 5 P.M., the temperature had risen to 100$\frac{3}{5}$° and after that fell gradually to 100° at 11 P.M. A blood spread taken at this time failed to show any intracellular parasites. In other words, the time of the chill had passed without any appreciable rise in temperature.

A complete blood count at this time showed the following: Hemoglobin, 16 per cent. (Fleischl). Red cells, 1,216,000; white cells, 8,000; polynuclear neutrophiles, 13.0 per cent.; large lymphocytes and mononuclears, 23.0 per cent.; small lymphocytes, 54.0 per cent.; myelocytes, 1.0 per cent.; transitional cells, 9.0 per cent. Four normoblasts seen in counting 100 white cells. The red cells show marked anisocytosis and poikilocytosis. Megalocytes are numerous. No basophilic stippling.

Owing to the poor condition of the baby, it was decided to start quinin medication at once. One-half grain of the bisulphate dissolved in water was given by mouth every four hours, the child receiving twenty-two doses in the course of five days. From the second day on, ½ grain of the saccharated carbonate of iron was administered once daily in a milk feeding. Human breast milk obtained from another nursing mother was fed the baby from a bottle.

On this treatment the child's condition rapidly improved. On the fourth day plasmodia could no longer be found. The hemoglobin index rose steadily, so that in eighteen days it had risen from 16 to 52 per cent. The child after an initial loss in weight to 5 pounds, 12 ounces, steadily gained until, at its discharge on March 12th, it weighed 6 pounds, 12 ounces During this time the temperature had only twice reached 101°; each rise, however, evidently being due to intestinal conditions. The baby did not appear to be more ill at the time the chill should have occurred and only showed periods of greatly increased sweating. Symptoms of collapse did not occur.

On April 10th, one month after discharge, the baby was getting on very well, having been put on a simple milk mixture. On that date the blood count was as follows: Hemoglobin, 65 per cent. (Fleischl). Red cells, 3,488,000; white cells, 10,000. Differential count: Polynuclears, 19 per cent.; eosinophiles, 1 per cent.; large lymphocytes, 16 per cent.; small lymphocytes, 64 per cent. The spleen was still considerably enlarged. The infant's weight was 8 pounds, 13 ounces.

To summarize briefly: An infant born in New York City at the end of December, of a mother who had suffered from untreated tertian malaria for four weeks during the fifth month of pregnancy, was taken ill at the age of four weeks. After three weeks the symptoms—pallor, irritability, green stools and loss of weight—caused the mother to bring the baby, now seven weeks of age, for medical advice. An extreme anemia and an enlarged spleen led to a blood examination with the finding of tertian malarial plasmodia. Rapid recovery under administration of quinin and iron.

Though it may be admitted that there is no way of definitely proving this to be a case of congenitally acquired malarial infection, the evidence all seems to point toward that conclusion; for it is almost incredible that in that portion of New York City where the patient lived (West 120th Street), there should have been mosquitoes capable of transmitting the disease in the midst of winter, *i.e.,* between December 23d and the middle of January.

That malarial plasmodia may be transmitted to the infant and discovered in its blood at birth is now admitted, as was cited in the earlier part of this paper, and I am fortunate in being able to add the following case to those already reported. About eight years ago a woman who had some time previously suffered from malaria, was seized with chills and fever a few days before she gave birth to an apparently healthy child. Plasmodia having been seen in the mother's blood, the new-born baby's blood was examined *immediately after birth* and in it also plasmodia were found. The child did not appear ill, was given a few doses of quinin, when the plasmodia disappeared and the child suffered no further inconvenience. This case occurred in the practice of Dr. L. Hauswirth, who showed the case at the time but never published it. I am greatly indebted to him for permission to report it.

That malarial infection in the adult may remain latent for a considerable length of time is well known, and now that the parasites have been seen in several instances in the blood of the new-born infant, I can see no reason why a case such as I have reported above at length should not be considered as a true case of congenitally acquired malaria, in view of the fact that post-natal infection seems to be positively excluded.

In the present state of our knowledge it is of course impossible to tell exactly how the plasmodia pass from mother to fetus. Careful histological work has failed to show any instance where the organisms seem to have passed through the intact placental tissue. Infection of the fetus may, however, as has been suggested, perhaps depend on small areas of placental separation.

Another fact that ought not to be lost sight of is that in practically all the reported cases the infants at birth and during the first few days of life appeared to be perfectly healthy. Would it not seem more likely that if infection were to have taken place in utero the child would show, as a result, some evidences of cachexia or anemia? The healthy condition of the new-born would therefore speak in favor of the infection taking place during labor, rather than during pregnancy. It is, moreover, difficult in my case to conceive of the fetus having become infected during the fifth month of intrauterine life and then to have carried the plasmodia without showing any signs of disease until the first month of extrauterine life.

I believe, therefore, that, though my case of malaria is another one to be added to the small number in which post-natal infection can be excluded, we are not as yet in a position to answer definitely exactly how the infection of the offspring takes place.

SUPPLEMENTARY NOTE.

Several months after the completion of this article, the infant, whose case is described in detail, was taken suddenly ill with symptoms of acute intestinal intoxication. Although it had been in excellent condition, constantly gaining in weight, it succumbed to this infection, dying in a convulsion about twenty-four hours after the onset of the illness. It was not seen by any physician during this illness. An autopsy was performed twelve hours postmortem.

The only abnormality in the gross findings was a very large thymus (weight, 22 gms.). There was no evidence of excessive pressure of this on the surrounding organs. There was no hyperplasia of the lymphoid tissue, either at the base of the tongue, or in the follicles of the intestinal tract. The spleen was normal in size and consistency. The mucosa of the intestinal tract showed no injection or erosion.

Microscopical Examination.—The liver showed a slight grade of beginning diffuse necrosis. The kidneys showed a moderate acute nephritis. The spleen revealed some hyperplasia of the Malpighian bodies and showed the presence of considerable pigment throughout its substance. This pigment was not iron-containing. Malarial parasites were searched for in the spleen, but none were found.

I am indebted to Dr. W. Thalhimer for assistance in studying the microscopic sections.

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OCCULT BLOOD IN THE STOOL.—Boas (*Berl. klin. Woch.,* 1913, No. 4) has modified the test for occult blood in the stool as follows: Several fecal lumps, each about the size of a bean, are rubbed up in a porcelain dish with a mixture of one part glacial acetic acid to three of alcohol. The mass is poured on a small filter; if the filtrate is a very dark brown color, it may be diluted with a few c.cm. of alcohol. A little powdered guaiac is dissolved in alcohol, so as to make a pale yellow solution. Of this, 10-15 drops are added to the filtrate and, without shaking, 15-20 drops of hydrogen peroxide. A blue or violet color indicates the presence of blood.—*Interstate Medical Journal.*

THE SIGNIFICANCE OF THE MINERAL SALTS IN THE DIGESTIVE DISTURBANCES OF INFANTS.

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Salt metabolism in infants is a subject that has received very little consideration until quite recently. Salts are necessary both to vegetable and animal life and their importance must be borne in mind in infant feeding.

The necessity of the salts to all forms of life has been carefully studied by Foerster, who laid the groundwork for investigation along this line in recent years.

He experimented on dogs, withholding the mineral salts while in all other respects the feeding was all that was necessary for the bodily metabolism; and the dogs died at the end of twenty-six to thirty days. Other experiments have been made demonstrating the necessity of salts in metabolism. However, we are not so sure regarding the *specific* salts necessary to the preservation of life. We do know that organisms cannot survive without iron and calcium.

In order to investigate the significance of specific minerals, we must begin our experiments on plants and lower animals, and in this manner we are better enabled to understand the changes that take place in the feeding of variable amounts of salts to the infant child.

The botanist has succeeded with the help of the so-called "transparent" method of water culture to demonstrate the necessity of certain specific mineral substances. In this method the plant is submerged in a water solution of the intended nourishment and the growth or the retardation noticed. The absolute necessity of calcium, sulphur, phosphorus and potassium has been proven for the successful development of the plant. Deficiency in iron produces plants without or deficient in chlorophyll. It is a surprising fact that sodium salts are not as important to plants as to animals. Jacques Loeb, on noting this fact as one of the few differences between the plant and animal kingdom, made the remark that perhaps the sodium salts were necessary to maintain the rapid movements of the heart beat and of respiration which were not present in the plant.

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* From the Department of Pediatrics, University of Michigan. Read before the Senior Class, May, 1913.

For the production of the whole plant, the law of minimums which Liebig discovered holds, namely, that the fertility of the soil is proportional to that quantity of particular nourishment which is present as a minimum. Thus if an elementary salt be present in only a very small quantity, then in spite of all other excesses of salts only a subnormal plant growth is possible.

Again certain salts that may be poisonous when acting alone may be innocuous when combined with certain other salts, which thus act in an antidotal manner. This is shown in the marine plants (algæ), for a solution of sodium chlorid isotonic to sea water has a much more poisonous effect upon them than has distilled water. Loeb also found that physiological salt solution was poisonous for certain marine animals and their eggs. For the "Fundulus" it was more poisonous than distilled water. However through the addition of small quantities of potassium and calcium the poisonous effects were no longer noted. Through laborious experiments of Loeb and Herbst a physiologically balanced salt solution was obtained, *i.e.,* a solution whose salts were present in such a proportion that all poisonous effects were eliminated which otherwise would be present if each salt were in a solution by itself.

The success in antidoting the poisonous effects of sodium chlorid is also true of other quite poisonous ions, such as magnesium and barium. As Höber expresses it, "One can hardly imagine anything more of a monstrosity than the fact that salts, such as common sodium chlorid for example, which is generally believed to be absolutely harmless, should prove to be such an effective poison, while other salts that are generally believed to be poisonous should become restorative in action."

Sodium, potassium and calcium ions play the main rôle in these antagonistic processes, and these same three elements have important biological functions to perform in the higher developed organisms.

Sodium chlorid is the only salt that we deliberately add to our food. The other inorganic materials are taken unconsciously in our diet. It is estimated that the average man ingests 10 to 20 grams of sodium chlorid a day. Although sodium chlorid exists in our food in quite large quantities, we add to this amount a certain portion daily. Many animals also exhibit this peculiarity, as is shown by the wild animals that visit the salt licks constantly. Bunge has called attention to the fact that among men and animals this desire for salt is limited, for the most part, to those that use vegetable food. On a purely animal diet this craving no longer exists, while on a purely vegetable diet the craving becomes very unpleasant and intense when circumstances prevent its being obtained. He offers an ingenious explanation for this relation. Most vegetables contain a large amount of potassium salts, and in the blood these salts react with the sodium chlorid. Thus, if potassium sulphate were added to the blood it would react with Na. Cl., giving some potassium chlorid and some sodium sulphate. Both of these salts will be removed by the kidneys, since they are foreign to the blood, except in minute amounts. The blood will thus lose some of its supply of sodium salt, whence the craving for more in the food.

The sodium salts in the blood and lymph take the chief part in the maintenance of normal osmotic pressure. The sodium chlorid exists in the blood plasma to the extent of 0.5 to 0.6 per cent. Physiological saline is composed of a solution of 0.7 to 0.9 per cent. Na. Cl., and this solution fulfills the purpose of maintaining the normal composition and properties of the tissues more perfectly than the solution of any other single substance. The sodium ions have in addition a specific influence on the state of heart tissue. Contractility and irritability disappear when they are absent. When present alone in the medium in which the heart tissue is bathed they produce relaxation.

A frog's or terrapin's heart may be removed from the body and beat well for a while if fed with physiological salt solution, but the beats soon weaken and gradually fall out. If in this condition the heart be fed with a proper mixture of sodium, potassium and calcium chlorides it beats vigorously and well for several hours. Such a mixture is the so-called Ringer's solution. Sea-water, blood-serum and Ringer's solution contain these salts in practically the same proportions and are thus isotonic to each other. It was this idea that led us to think with Loeb that we carry the inheritance of the ocean with us, since ocean water and blood serum have the same correlation of salt solutions. The calcium salts of the body play a most important rôle in connection with the irritability of muscle and nerve. Calcium salts are present in relatively small quantities in the blood, but are absolutely necessary for contractility and irritability. They are obviously of great importance in furnishing material for the growth of the skeleton. Young dogs when given a diet poor in calcium salts fall into a condition resembling rickets in children. Pigeons also when fed on a similar diet exhibit an atrophy and fragility of the bones due doubtless to the lack of calcium salts. There is undoubtedly a definite calcium metabolism in the body, although most of the calcium salts ingested simply pass through the body without entering into the structure, and appear unchanged in the feces and urine. "It is estimated that 0.15 to 0.16 grams per day is eliminated from the inner surface of the intestines." This amount is lessened in infancy and increased in old age. It is also increased under pathological conditions as evidenced in the calcium carbonate deposit in arteriosclerosis and in the crystalline lens in senile cataract.

According to L. F. Meyer a rise in the sodium concentration of the blood increases the irritability, while calcium salt concentration tends to check this increase in irritability. Therefore, as Loeb says, we must thank the calcium in our blood that our muscles do not constantly twitch. These facts have an important bearing on the suckling child as we shall see later.

As an example of the interdependence of the sodium and calcium salts, it has been suggested that in a case of diarrhea the increased intestinal peristalsis is due not so much to the increased salt content in the intestine, thus attracting more water to the alimentary tract, but to the fact that the calcium ions acting on the splanchnic nerves are diminished. On this theory the ingestion of calcium would thus be an excellent substance for controlling certain kinds of diarrhea.

As long as forty years ago Bock and Hoffman acquainted us with the fact that a glycosuria can be effected by an intravenous injection of salt solution. Fisher claims that this glycosuria may be caused to disappear by a succeeding injection of calcium chlorid.

In addition to the effect produced by mineral salts as above mentioned, they also have some action on rennet, have a slight bactericidal action and are in some way related to agglutinization and catalytic processes.

The salts further affect the osmotic pressure in all forms of organisms. But whether the energy of osmotic pressure is of any service to the body is doubtful, because the application of energy will be again necessary for the excretion of the salts. No matter how many molecules of salt we take in, in a short time the pressure is the same in all mammals in spite of different chemical combinations. This pressure is about 8 atmospheres and corresponds to a 1 per cent. Na. Cl. solution.

This chemical analysis has, in the last ten years of the history of pediatrics, discovered a large number of new and important facts.

The mineral salts that a suckling needs is furnished by the physiological nourishment—the milk of the mother. This is taught by the general experience that babies grow well when breast-fed. Yet recently by three distinct authors—Aron, Dibbelt and Schabad—the question which was raised long ago has been brought up again, namely, whether the amount of calcium in the mother's milk of the modern state of civilization fulfills the demand of the growing organism. It must be admitted that the calcium content in woman's milk is astonishingly low. A careful estimation of Magnus Levy's, a content of 42 to 80 grams of calcium in 140 liters of milk that a suckling drinks in its first six months, stands against 40 grams that should be used in the infant metabolism. From what we know of the suckling child about 75 per cent. of that taken in is absorbed, *i.e.,* 26 to 50 grams.

We cannot discard the fact that a mother giving milk poor in calcium does not fulfill the demand for calcium. Under certain circumstances this produces the pseudo-rickets, *i.e.,* the deficiency of the calcium in bone.

Clinically, we may be able to distinguish between the pseudo and the true rickets in that one is improved by the feeding of calcium, while the other is not influenced by an excess of calcium. The question whether the prescription of the calcium salts of phosphoric and carbonic acids as advised by Beneke thirty-five years ago will increase the calcium salts in breast milk is still undecided. At present only Dibbelt has demonstrated it and this only in 2 out of 3 cases. An exact answer to this question grounded on extensive experiments is much to be desired. If it is possible to increase the calcium content of the milk we must still ascertain whether the increment of calcium will be absorbed by the child.

Bunge makes an interesting observation that the inorganic salts of milk differ quantitatively from those in the blood plasma and resemble closely the proportions found in the body of the young animal, thus indicating an adaptive secretion.

Although cow's milk contains a greater amount of ash than woman's milk the osmotic pressure is the same in both and equal to that in the blood. The pressure is affected first by the salts and second by the sugar. The following table illustrates these facts, giving mineral constituents in 100 parts of the ash:—

	Young pup.	Dog's milk.	Dog's serum.
K_2O	8.5	10.7	2.4
Na_2O	8.2	6.1	52.1
Ca O	35.8	34.4	2.1
Mg O	1.6	1.5	0.5
Fe_2O_3	0.34	0.14	0.12
P_2O_5	39.8	37.5	5.9
Cl.	7.3	12.4	47.6

We owe the demonstration of the physical properties of milk especially to Koeppe, who was the first one to bring to our notice the active part which minerals in solution take in digestive processes according to the laws of physical chemistry. He has shown through the determination of the freezing point and conductivity that woman's milk has more effective osmotic molecules than can be estimated from a chemical analysis of the ash and sugar content; that a part of the mineral matter in breast milk as well as in cow's milk is present in a neutral state that does not conduct electricity, which is likely in combination with organic molecules. It would be too early to draw conclusions from these facts as to digestive problems, as has been done repeatedly in times past. They have spoken of osmotic dietetics and have required that artificial feeding have the same osmotic pressure as breast milk. That they are on the wrong track is proven by the numerous failures which occur with cow's milk thinned so that it is iso-osmotic, and further proof is the success which is obtained in the dietetics of digestive disturbances with malt gruel and buttermilk. The latter, according to Helene Stoltzners, has a much greater osmotic pressure than breast milk.

On this point L. F. Meyer has the following to say: "It seems wrong to me to judge the digestibility of food on the basis of the free ions, considering breast milk to have a great number of free ions. On this difficult subject we should be satisfied by determining facts and not reach conclusions on the ground of obscure phenomena." It has been an error in past decades to place too much attention on a single point in infant feeding.

However, the view of the Finkelstein school is probably correct, namely, that the difference in the effect of breast and cow's milk is produced by different kinds of caseins and not due to the osmotic pressure of the two liquids.

The absorption of salt solutions is influenced by the physical laws of osmosis, but is not subject to them. Both physical and vital processes come into play and definite laws regarding absorption are hard to establish. Lunin made the discovery that salts must be combined with organic matter before they can be utilized by the cells of the body. He fed mice on the ash-free dried milk, with the result that they died quickly. If salts were added to this ash-free dried milk they still died at a rapid rate, while when fed on dehydrated milk from which the salts had not been removed, they throve. He also found that mice fed on ash-free dried milk to which sodium carbonate was added survived much longer, but also died. Rhumon also did work along this line and fed mice on organic and inorganic food substances. His mice lived and were able to reproduce their young. The young, however, could not be raised on artificial food, and those which received natural nourishment were unable to produce live offspring.

The amount of ash or salt retention is comparatively small in proportion to the amount ingested, only 4 per cent. being retained. In the first six months the following amounts of salts are retained. In the 140 liters ingested 120 to 140 grams of salts are retained. 30 to 58 g. K_2O, 26 to 50 g. CaO, 24 g. Cl., 10 to 12 g. Na_2O, 12 to 16 g. P_2O_5, 6 g. MgO, 2 to 3 g. Fe_2O_3.

The law of minimums holds for the growth of the child as well as for the plant, with the exception of calcium and iron deficiency, which cause no decrease in the general growth, but calcium deficiency affects the growth of the osseous system, and iron deficiency affects the blood.

The percentage of absorption and retention of salts in woman's milk is always higher than cow's milk. The salts of cow's milk are not in the same organic combination as the salts in woman's milk as shown by Keller, and this has undoubtedly something to do with the peculiar adaptability of woman's milk to infantile digestion. Meyer has shown that the whey of woman's milk is a better menstrum for the fat and casein of cow's milk than is the whey from cow's milk. On the other hand, if the whey from cow's milk be added to the fat and casein of woman's milk the absorption and retention is poor and infants thus fed do not thrive well.

The significance of salts in the retention of water in the infant body was first shown by Freund.

He noted the great changes in weight in an ailing child in the change of food from one poor in salts to one rich in salt content. Freund tried to find out what changes took place in the body metabolism during these weight variations. He tried to prove that chlorides were retained when the great increase in weight took place. The great increase in body weight was accompanied by relatively smaller excretion of urine and *vice versa* when the body weight was decreasing the urinary excretion was accelerated. His experiments were however not conclusive. That the increase in water is also accompanied by an increase in inorganic material is not made clear by him. In a healthy child if salt be added to the diet there is an increase in weight just as is noted in nephritic cases. This increase in weight is all due to an increase of the water content of the body. It is easier to produce this edematous condition in a young child by addition of salt to the diet list than is the case in an adult. Why this is so is not definitely known, but is probably due either to the thinness of the capillary walls, or else the kidneys have not become sufficiently developed to withstand the burden of excretion of the chlorides.

In feeding this sodium chlorid solution the best results are obtained when given in the same proportion as is present in physiological salt solution. As to which ion causes the water retention it has been conclusively proven that the chlorine ion is responsible.

The sodium ion does not seem to be effective in this respect. The effect of K and Ca ions is to either not affect the weight curve or else to cause a diminution through the union of potassium bicarbonate, potassium phosphate, calcium chlorid, or calcium acetate. Animals that were fed a deficiency of calcium grew normally. The negative effects produced by potassium at times may be due to the fact that potassium salts take the sodium salts away from the organism.

These same relations between the intake of mineral salts and the regulation of bodily temperature seem to exist. Deprivation of salts lowers the bodily temperature, while an addition of salts tends to increase the bodily temperature.

The salt fever resulting from the subcutaneous injection of small amounts of sodium chlorid solution was first described by Schaps. In a subcutaneous injection there may be a small amount of hemorrhage and tissue destruction and on this account the question has been raised by Goefferje-Möllhausen whether the fever present is not a true protein absorption fever. Favoring this view is the fact that a fever may be produced by the injection of distilled water, while opposed to the view is the fact that no temperature increase is produced by the hemorrhage produced with a cupping glass or by the injection of air subcutaneously.

In an effort to bring about a decision in this matter Rietschel and L. F. Meyer made injections with physiological salt solutions to which small amounts of potassium and calcium were added. In a portion of the cases so experimented upon the fever and reaction were much less than in former experiments. They however do not think their experiments are conclusive. They think that perhaps the sodium chlorid combined with the other salts does not have the same deleterious action and tissue destruction that the Na Cl salt solution alone has. Rosenthal has shown that all substances that may cause a fever when given subcutaneously or intravenously do not also cause a fever when absorbed through the gastrointestinal tract. It has been shown that if there is any abrasion of the intestinal mucosa and salts be then taken in excess, that a salt fever will result.

Salge raises the question of the value of the salt fever experiments to infant feeding. He criticises the idea of applying the information gained from administering large quantities of salt at one time to the conditions obtained in infant feeding where the salt concentration is very slight. Other authors discredit the salt fever work; Helmholtz of Chicago could not demonstrate it, and Frieberger could demonstrate it in only one-third of his cases. Cowie* has demonstrated marked pyrogenic reactions following the administration of Na Cl by gavage, and by means of control experiments with $NaHCO_3$, in which case no pyrogenic effect is found, confirms the belief that the febrile reaction is due to the halogen combinations of sodium.

Since the introduction of salvarsan much interest has become attached to the reaction produced in certain cases after the injection. By using water that had been distilled for some time a reaction nearly always occurred, while if water which was freshly distilled was used reactions seldom occurred. This is explained by the fact that bacteria may multiply and thrive in distilled water and when the water is used even if boiled there is enough protein or bacterial toxin present to produce a rise in temperature. Therefore at the present time only the freshly distilled water is used in administering these solutions.

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* American Journal of Children's Diseases, 1912, Vol. IV., p. 371.

In contradistinction to this is the work of L. F. Meyer, who places all the emphasis on the effect of salt in these fevers. In his experiments with different salts he found that sodium salts elevated rather than decreased temperature, while calcium salts, especially calcium chlorid, produced a lowering of temperature even to the point of collapse temperature. Potassium salts occasionally produced an increase in temperature, $K_2\ CO_3$ and $KH\ CO_3$ produced this increase most often, while K Br, K I & K Cl and K phosphate produced more often a lowering of temperature. In these experiments the specific ionic action was apparent and it was the cations that were effectual in temperature changes. The pulse rate changed with temperature change in every case. Rosenstern also observed a polynuclear leukocytosis accompanying the temperature elevation. At the height of the fever the leukocytosis was present that reached its acme in fifteen hours and sank to normal inside of twenty-four to forty-eight hours.

Let us now consider Finkelstein's classification of the digestive disturbances in infants and see the rôle played by salts in these disturbances.

It has been shown that fats affect the absorption of salts. An increase in fatty foods effects a slight reduction of the absorption of mineral matter in a healthy child, with a better balance resulting. With a child having gastrointestinal disturbances, an increase in fat produces a disturbance in the balance, so that great quantities are given off in the stool.

In the experiments of Birk-Rothberg along this same line, calcium and magnesium were given off in the stool, while in Steinitz's experiments large quantities of the earthy alkalies were given off. An explanation of the difference in the results of the two experiments lay in the condition of the children upon whom the experiments were conducted. In the former case the children were in the condition of balance disturbance, while Steinitz worked with the children having a diarrhea and severe gastrointestinal disturbances.

In some of Meyer's experiments in feeding a child with balance disturbances diluted milk, he noticed at first a loss of calcium and phosphorus in the stool. Later as the child became more disturbed in its intestinal tract it retained Ca and Phos and gave up the earthy alkalies.

Excessive fatty stools do occur with a loss of calcium and this leads us to inquire the relation between the two. One is inclined incorrectly to lay the cause of the fatty stools to intolerance for fatty foods. Food too rich in casein or too poor in sugar causes a fatty, soapy stool. Oftentimes the fatty stool may be overcome by the use of carbohydrates, especially milk sugar. In cases of fatty stools the fatty acids combine with the earthy alkalies and a reduction of calcium and magnesium results in a negative balance. However, with the loss of the Ca and Mg, there are probably other forms of mineral matter also lost, and it is these that affect the growth of the child and disturbances in cell functions.

In the stage of gastrointestinal intoxication only one experimental work has been done, and this was negative regarding salt action.

In the stage of decomposition there are soapy stools. The body is robbed of the earthy alkalies due to their combination with fatty acid, forming soaps. The diarrhea present also causes a loss of alkalies. This can only be cured in the first and second stages by the use of breast milk. Breast milk is poor in salts and rich in fats and carbohydrates, and it is a seeming contradiction that it should cure a digestive disturbance caused by loss of alkalies.

In the favorable cases of children in the stage of decomposition the stage of reparation sets in. In the first few days after the feeding of breast milk has been instituted, the loss of minerals keeps up and the child appears to be in a worse condition than formerly, has a low pulse, subnormal temperature, etc., but in a few days the absorption and salt retention increases and the child from then on steadily improves.

We thus see that salts perform a definite function in infant metabolism and their presence or absence must be taken into account in considering the subject of infant feeding and digestive disturbances.*

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* In the writing of this article the work of L. F. Meyer in the *Zeit. für Kinderhk.*, 1910, entitled "Die Bedeutung der Mineral Salze bei den Ernährungs Störungen des Säuglings," was closely followed. Other articles consulted were Howell, Cowie's Milk Notes and other references referred to in Meyer's article.

THE ETIOLOGY AND SYMPTOMATOLOGY OF NERVOUSNESS IN INFANCY.*

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Although the existence of such entities as neurasthenia and hysteria in infancy has not been established beyond possible controversion, nevertheless there occur in infancy definite manifestations so evidently functional in character that we are justified in looking upon them as nervous. Likewise, certain neuroses of older children and of adults may be proven to rest on a neurosis arising in infancy, and inasmuch as there is a direct etiologic relationship between nervousness of parent and nervousness of child, I feel justified in presenting before this body a paper on nervous symptoms in infancy.

The age period is thus limited to the first twelve months of life, as an abundant literature exists on nervous conditions of later childhood, which differ not essentially from those of still later years.

In presenting such a subject, whether dealing with infancy or adult age, it is necessary to bear in mind the ever-narrowing scope of the term "functional," and to realize that tomorrow may demonstrate an organic basis for this or that sign or symptom, where today none is recognized to exist. The Vienna school, in its effort to place on an anatomical basis the nervousness hitherto considered purely functional, has provided us with the interesting conception of vagotonie, application of certain phases of which I will make use later. I am limiting the discussion of this paper merely to causative factors and symptomatology.

As causative factor of the neuropathic constitution there stands in first place the influence of the nervous parent, an influence of twofold nature. There may be the actual heredity of a neuropathic constitution, or the otherwise sound child may, by mere reflection of his milieu or environment, present the picture of a nervous child. As predisposing to hereditary influences, one must, of course, consider alcoholism, consanguinity, nervous diseases, such as insanity, epilepsy, hysteria and neurasthenia, and physical diseases.

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* Read before the Detroit Society of Neurology and Psychiatry, December 4, 1913.

More important, to my own mind, however, is the effect of a nervous environment on the infant in his first months of life. The infant is unusually susceptible to influences about him; his little plastic brain can receive countless impressions which keep it in a state of continuous activity. Nervous and emotional stimuli impress themselves upon him as readily as do impressions of a more substantial and material cause. The child that is fussed about, played with unwisely and unduly, the object of over-solicitousness and fearfulness on the part of those to whom it is dear, reacts to this state of nervous tension and anxiety with the symptoms to be discussed later. We do not believe that tuberculosis is hereditarily transmitted except in unusual or rare cases, but we do know that no infant exposed to an open form of tuberculosis escapes some form or other of the disease. The point under discussion is quite analogous, and no baby is exposed to a nervous environment without reflecting a nervous disposition. One of the earliest tendencies in human life is that of imitation. According to Czerny,[1] the very laugh of the nursling is an imitation of the laugh of the one who nurses it or cares for it. The play of its features is under the direct influence of the picture of the surrounding personalities. How readily the production of nervousness may be influenced by the mere factor of imitation is evident. The parent who complains that his child is nervous merely confirms the fact of his own nervousness, for *a priori* nervousness of the infant only occasionally exists. He is but the innocent victim of the unfortunate state of his older companions.

It is not to be denied, however, that causes may arise within the infant himself productive of this same state. Long-continued infection or nutritional disease, the consequence of fright, and all those causes that make for physical deficiency, may readily operate toward this end, not only as predisposing, but as causative, factors. But it is a significant and striking fact that those infants who are subject only to general nursing care, minus the factor of parental or household affection, anxiety, or indulgence, that is to say, hospital infants, show, in contradistinction to babies seen in private practice, a marked stability of equilibrium and relative good nature and repose. This observation is pregnant with therapeutic suggestion.

Quite a separate etiologic factor enters into the case of the only child—and an interesting literature has sprung up recently on this point (Friedjung *et al*[2]). Without going too fully into this rather obvious point, it may be said the *"Einziges Kind"* suffers quite a decided handicap in comparison with the children of larger families. There is concentrated upon his little self the care, solicitude, anxiety, watchfulness and indulgence, with all their consequences, which in larger families are divided among several.

An obvious handicap exists also in the case of the first-born, but especially so in the case of late arriving infants, that is, those born several years after the preceding child, where the element of brothers and sisters is added to that of parent, where the child is not the offspring of youthful parents, and where middle-age nervousness and solicitude exist.

Now the parent must not alone be considered the only agent in producing the nervous environment that surrounds the child. A nervous nurse may quite undo the promised influences of stable parents, and thoughtless, though well-meaning visitors, and heedless children may quite upset the little one's equilibrium. Of course the converse also obtains. There has just come to my observation a case in which the first born, cared for by a nervous mother, is a child of irritable temperament, while a second, entrusted from earliest infancy to an even-tempered nurse, betrays but little of nervousness. Attempts to stimulate an infant's intelligence are ill-advised, and in private practice it is found that infants develop best mentally and nervously when their little bodies are well cared for and they are left alone in other respects. To excite the attention of a child in order to stimulate thereby the development of its intelligence can work only disadvantageously.

Particularly is the bright, the nervous, and the precocious child to be conserved in this respect. Its active brain should be held in check, rather than stimulated, and Czerny points out the need of extra watchfulness at the age when the baby first learns to get about upon its own feet. Then countless new sights and sounds enter his world, and each produces on his little mind a fresh impression. At this age the nervous child particularly should be inhibited, and should be confined largely to simply furnished and decorated rooms or his own little fenced-in enclosure.

In the consideration of symptomatology, it may be said in general that the neuropathic state is characterized by the reaction to a nervous, psychic or emotional stimulus with an effect of greater intensity, longer duration, and of a greater increasingly cumulative response to the stimulus than in the case of the normal child.

The German writers, notably Oppenheim,[3] place as foremost among the symptoms of nervousness in nurslings the disposition to fright. A sight, a sound, a movement, an effort to examine, awakens in the nervous infant a response of fear under circumstances in which the normal child remains indifferent, passive, or but moderately perturbed. It draws its little body together sometimes in an attitude of defense, or places its little limbs in an attitude of warding off. Coincidentally it manifests other important symptoms. It raises its voice in crying—raises its voice in pitch, and sustains unduly in point of time its high cry of fright. These constitute a second symptom of the nervous state—the lability of the voice—that is, the readiness with which vocal outbreak is elicited, the highly pitched screaming, and the long duration of the cry, subsiding now and then to break out afresh and in increased degree. The high-pitched voice is one of the most frequent and obvious signs by which the nervous state can be recognized. This lability of voice is closely related to a third symptom—irritability. As the nervous child reacts more readily to an unpleasant stimulus by crying, so does he respond more actively to an agreeable stimulus by smiling or laughing, or wriggling with delight. He is, furthermore, easily excited to outbreaks of anger of long duration, which are quite as readily recognized by the expression of the features of the little red face as by the audible evidence. There seems to be a state of thermolability and nervous babies often react with higher temperature than do other infants. Another symptom of importance is a change in the emotional state—the exhibition of displeasure in response to a stimulus formerly productive of pleasure. Toys, tunes, odors, or food which formerly brought delight, may suddenly, and without apparent cause, be rejected with signs of most evident disapproval by the infant under discussion.

The nervous baby is notoriously a light sleeper. Unless actual digestive disorder can be demonstrated to exist, or a source of actual physical discomfort or pain, most wakefulness in infancy can be demonstrated to rest on a nervous basis. These cases comprise some of the most troublesome and annoying of the pediatrician's experience. The nervous, wakeful child spends most of its wakeful hours in crying. Crying is almost invariably interpreted as meaning hunger. The baby is fed throughout the night, and nutritional disorder is engrafted upon nervous disorder often with the resultant production of a vicious circle. An important cause is playing with the baby in the evening, a fault most frequently occurring in the case of the first-born, the only child, and the late child. The infant which is brought out at night to exhibit its cunningness or precocity to visitors, or to the late home-coming father, has its little brain brought to a fine state of activity, and does not readily compose itself thereafter to sleep. But it is not insomnia necessarily that characterizes the nervous baby, rather, however, a lightness of slumber, so that on the slightest sound or movement in the room the baby enters again into a state of wakefulness.

Nervousness may manifest itself as well in the indisposition of the infant to remain at physical rest. There occurs a restless rolling and wriggling not to be confounded with the continuous short, choppy, purposeless movement of the normal, healthy baby.

Now important symptoms manifest themselves in the field of the vasomotor system, and here again we have a condition characterized by lability—frequent change in the color of the face, variations in the frequency of the pulse beat, dermatographia. Tezner[4, 5] has just published some interesting observations on symptomatology in infancy, referable to the sympathetic system. He finds under conditions of intoxication—the severe toxicoses—atony or paralysis of the sympathetic, together with increased sympathetic irritability. He finds as a consequence of sympathetic atony or paralysis—which in general he considers a bad prognostic sign—miosis, injection and drying of the conjunctiva, redness and dryness of the tongue and the mouth mucosa, livid skin, hyperemia of the meninges, of the flat cranial bones and possibly also of the brain itself. Related must be meteorism and the cold extremities in the presence of fever. (Parenthetically, coldness of the hands and feet, I have noticed in apparently functionally nervous children.) Tezner would distinguish all this sharply from the vagotonie of Eppinger and Hess.[6] This latter, he says, is a constitutional anomaly, while sympathetic atony is a pathological symptom. Eppinger and Hess would relate to vagotonie, pylorospasm, laryngospasm, an element in thymic asthma, urticaria and other manifestations in the course of the vagus nerve.

The nervous infant shows an increase of the deep reflexes. According to Ibrahim,[7] it may show a loss of its conjunctival and throat reflexes. This is an interesting observation in that the latter signs are considered by the Vienna school as pathognomonic of hysteria, that is, in adults. As to whether hysteria occurs in infancy is a much mooted point, most observers taking issue with the French school which holds to the theory that such an entity exists. Some time ago an interesting case came only momentarily under my observation, and disappeared again without furnishing opportunity for study of it. A baby one year old was brought to the dispensary of the United Jewish Charities on account of aphonia. It did not cry and was said to utter only a rather rough hissing sound, seemingly arising deep in the throat. This sound it uttered frequently during examination. It was a bright, playful, well-nourished, good-natured baby. It was said to have cried vociferously and continuously for the first twenty-four hours of its life. It was then discovered that a clavicle had been broken during delivery. The bone was set, the child stopped crying, and in spite of apparently normal development in all other respects was said never to have emitted any sound other than the one described. The child was gone over rather superficially and was ordered to return for complete examination. The only apparently significant point elicited was that both corneal and throat reflexes were absent. The infant was never returned for examination. No laryngoscopic examination had been made. On looking into the literature, I found as the causes of aphonia in infancy, deaf and dumbness and hysteria. The child evidently could hear. I offer this unfortunately poorly observed case merely for what it is worth.

The nervous baby is prone to the development of habits—sucking the thumbs, nail-biting, sticking the fingers in the nose, rolling the head and eyes, etc. Masturbation, while frequently due to anatomical causes, is fostered and the habit prolonged by the neuropathic tendency. Masturbation in the early months of life, especially among girl babies, is a frequent observation of the pediatrician and the general practitioner.

A mention must be made of the nervous nutritional disorders of infancy. One sees frequently in nervous patients, vomiting, lack of appetite, pallor, stand-still in weight, in the presence of no cause referable to the nourishment offered. As Hochsinger[8] points out, one must differentiate sharply between the neurosis which is the consequence of prolonged nutritional disorder and the nervous state which is productive of nutritional disorder, which in turn fosters the nervous state itself, as in the vicious circle heretofore mentioned. But Hochsinger is apparently convinced that a condition of vomiting, of dyspepsia, of anorexia, and of fits of rejecting of food, turning away the head, warding away the offered nourishment, etc., arise as the result of displeasure incurred during the feeding act and he has described a nervous "Kauunfähigkeit"—an inability in younger children to chew correctly, arising in faulty feeding technic in early infancy. Pylorospasm is quite probably related to an anomaly of distribution of the innervation of the stomach (Berend and Winternitz[9]).

Convulsions have a varied etiology associated with the nervous system. To go into the subject completely would be out of place here. It is probable that a true spasmophilia exists and that it may be demonstrated by increased electric excitability, and by Chvostek's sign in many cases. Convulsions may be on this basis, or they may be related to the whey element in accordance to the teachings of the Finkelstein school, or to the accessory thyroids, according to the school of Escherisch.

Tetany and eclampsia are not unrelated. Laryngismus stridulus is now looked upon as being a manifestation of the spasmophilic diathesis, but the possible influence of vagotonie must not be overlooked. Mimic spasms are definitely of nervous character, as are spasmus nutans and spasmus rotatorius. I have seen a ward of five babies develop spasmus rotatorius, not as the result of one mimicking the other, but because building operations partly shut off the light from the windows illuminating the room. The little heads turned toward the light, then back again. After repeated rolling, the pleasurable sensation induced produced a tendency to further repetition, and outspoken spasmus rotatorius resulted.

This subject must not be left without brief reference to the early signs of mental deficiency, if for no other reason than to define the mental state from the nervous one. The young mentally defective may be marked by unusual good nature and phlegmatic character. In comparison with the average reaction of the normal child to a moderate stimulus, the mentally defective in general does not react at all, while the nervous child overreacts. However, the prolonged, uncontrollable crying of infancy referable to no demonstrable cause is suggestive, if accompanied by other symptoms, of deficiency. These other symptoms are drooling, vacuous smiling, nystagmus, strabismus, protrusion of the tongue, incoördination of muscular movements, and the inability to hold the head erect and to sit upright.

I have not here attempted to establish the entity of the nervous infant, but merely to show that manifestations evidently of a functional character occur in the first twelve months of life.

513 Washington Arcade.

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USE OF AROMATIC ARSENIC PREPARATIONS BY RECTUM IN INFANTS.—A. Weill, A. Morel and G. Mouriquand (*Arch. de Méd. des Enf.*, July, 1913) state that, although the venous injection of salvarsan is preferable in adults, it is somewhat dangerous in infants, and the introduction of the drug by rectum is to be preferred. The veins are so small and a slight movement of the infant while the needle is in place may make so much difference in the absorption of the drug that it is best not to inject it. The authors have used the rectal method in late hereditary syphilis, severe chorea, and other diseases. In a case of hereditary syphilis there was limitation of the lesions in less than twelve days, and they began to retrocede. At the end of four weeks the perforation of the palate was healed, sight was better, and the parenchymatous keratitis was improving. Arsenobenzol seems to have a good effect in chorea, even of the severe form. Its action is rapid, but not enduring. The injection should be followed by arsenic internally. The authors conclude that this method is good in late heredosyphilis, and severe chorea, and that the passage of arsenic into the urine proves that it has been absorbed by rectum.—*American Journal of Obstetrics.*

UNILATERAL CONGENITAL HYPERTROPHY.*

BY JOHN SPEESE, M.D.,
Philadelphia.

The patient, a girl ten years of age, was admitted to the Presbyterian Hospital in the service of Dr. J. H. Jopson, to whom I am indebted for permission to operate and report the case.

The personal and family history have no bearing on the condition for which the patient was treated. The child at birth was normal, and when one month of age her mother noticed for the first time that the large toe on the right side was larger than the left. The child was several years of age when the leg was noted to be enlarged. The growth has been gradual until recently, when it increased rapidly in size. The family physician, when consulted, diagnosed the enlargement as elephantiasis, for which condition she was sent to the hospital.

The child is well nourished and shows no abnormalities, physical or mental, other than the hypertrophied parts. She complains merely of the inconvenience of the enlarged toe and foot, and for this condition only is relief sought.

The measurements are as follows:—

	LEFT.	RIGHT.
1. From the spine of ileum to internal malleolus	77.5 cm.	80 cm.
2. Circumference of thigh	36 "	37.5 "
3. Knee above patella	26 "	31 "
4. Knee over patella	27.5 "	32.5 "
5. Calf	23.5 "	28 "
6. Internal malleolus to internal condyle	37.5 "	40 "
7. Foot, tip of toe to heel	20 "	25 "

The patellar reflex is less active on the right side; there is no loss of sensation over any portion of the affected leg. Above the knee is a soft, spongy swelling extending from the internal to the external condyle, measuring 15 cm. x 12.5 cm., it is oval in shape, the skin is not involved and is freely movable over the mass which is fixed to the deep fascia of the leg.

A second mass is present over the tibialis anticus muscle. It measures 15 cm. x 7.5 cm. and has the same characteristics as the one described above.

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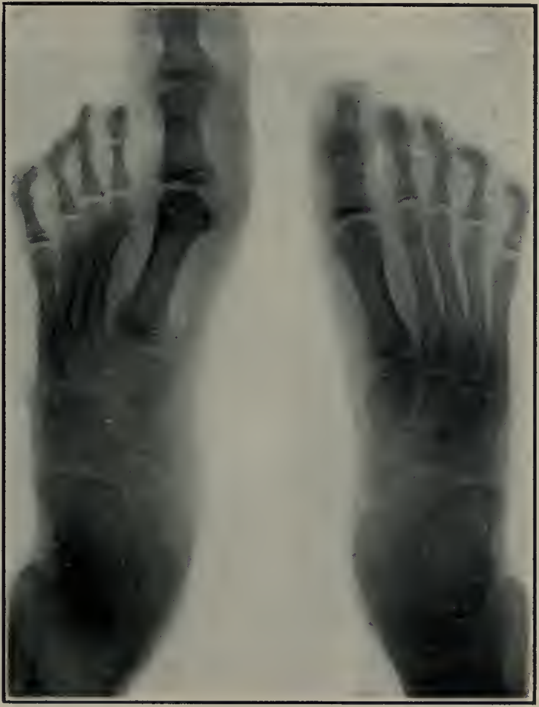
* Read before the Philadelphia Pediatric Society, November 11, 1913.

The degree of hypertrophy of the toe is seen in the X-ray reproduction. It will be noted that the first metatarsal bone is larger than the opposite one and that the hypertrophy also extends to the phalanges, which are increased in length and breadth.

Operation.—The distal and a portion of the proximal phalanx were amputated and a considerable amount of fat removed from the plantar surface of the toe. When sutured the end of the stump was on a level with the opposite toe, although the right side was of course considerably wider than the left.

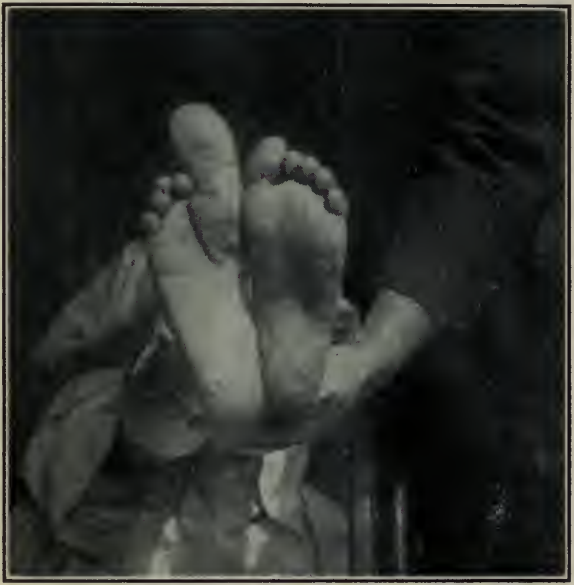


X-ray of foot in congenital hypertrophy.

The wound healed readily and in a short time the patient was able to walk without difficulty.

Pathological Examination.—The specimen consists of the distal phalanx of a large toe, which, with the soft parts, measures 4 cm. x 4 cm. A portion of the adjacent phalanx accompanies the specimen. A cross section through the soft tissues on the plantar surface shows a large amount of fatty tissue through which run many fibrous strands. The bone cortex appears thin and the medullary cavity filled with fat.

On microscopic examination the skin papillæ are poorly developed and appear flat but otherwise normal. The subcutaneous fibrous tissue immediately under the skin has a normal appearance, but a short distance beneath this level it becomes infiltrated and distorted in outline by the fat cells which are found in great numbers throughout the tissues. In many areas the fatty tissue with a very thin fibrous stroma predominates, but in other areas bundles of dense connective tissue containing a few cells are seen. The tissue, for the most part, contains comparatively few blood vessels. The larger ones show a decided thickening of the vessel walls, which in some instances has almost completely obliterated the lumen. The overgrowth of the vessel walls seems to be limited to the large vessels, although slight thickening of the smaller vessels is also noted. A small amount of muscular tissue is irregularly distributed throughout the section; the tissue is surrounded by fat cells, which seem to infiltrate and destroy



Plantar surface of hypertrophied toe.

the outline of the muscle fibers. Many small nerves are seen which do not show any evidence of degeneration when stained by the Weigert method.

A cross section through the bone shows marked thinning of the cortical substance; the canals contain a large number of thin-walled blood vessels and fat cells. The bone trabeculæ have a fragmented appearance, the medullary canal containing comparatively few cells but a large amount of fat. Toward the epiphyseal end of the bone the cartilaginous structure appears regular in outline, but here and there traces of fatty infiltration are noted.

The hypertrophy in this case has been limited largely to the soft tissues, where pronounced fatty and fibrous overgrowth is apparent. A moderate thickening of the blood vessel walls is also noted. The bone shows a rarefaction of both the compact and spongy portions, this change being associated with fatty infiltration.

Although the tissue causing the enlargement about the knee and calf was not examined, it is to be presumed that it is of similar character to that causing the hypertrophy of the toe.

Unilateral hypertrophy in the majority of cases is noted soon after birth, and is a congenital affection according to most authorities. There are a few cases on record, however, in which the hypertrophy was not noted for several weeks or months after birth, and in one instance as late as the second year of life. In the case which I have reported, the mother was positive that no abnormality was present until the child was one month old.

The hypertrophy may be localized or general; it may affect the head and face or a part of either, a whole limb or a mere fragment. Greig separates the cases into the following divisions:

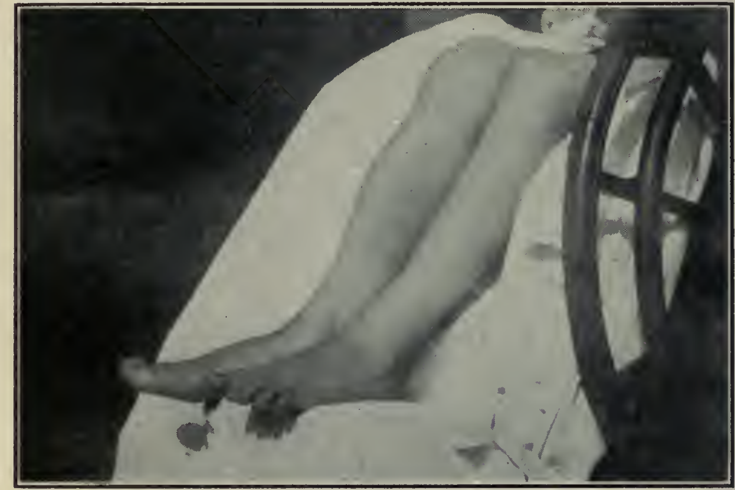
(1) Unilateral hypertrophy of the head and face.
(2) Unilateral hypertrophy not limited to head and face.

Both of these divisions are subdivided as follows:—

(*a*) Bones only affected.
(*b*) Soft parts only affected.
(*c*) Bones and soft parts affected.

The extent of the hypertrophy varies from the involvement of a single digit to an overgrowth affecting one-half of the body. The hypertrophy does not appear to have any rational anatomical explanation, nor to follow the distribution of the vascular supply of the part affected, but in some cases it seems to be limited to the areas supplied by certain nerves. The rate of growth is likewise inconstant, for in some cases the hypertrophy has simulated a malignant growth because of its rapid progression, whereas in other instances the hypertrophy has been slow and progressive in nature. The malignant character is demonstrated in the case reported by Jones, in which recurrence took place after removal of the hypertrophy, which was lipomatous in nature.

The association of congenital tumors of various kinds with cases of congenital hypertrophy constitutes an important fact in explaining its etiology. Lipoma, angioma, lymphangioma, osteoma, chondroma and teratoma have been described. In 11 of 42 cases (Greig) the skin showed some affection which varied from mere pigmentation to telangiectases or huge nevi. The common occurrence of dilatation of the vascular channels has led to the view that the hypertrophy is the result of the increased nutrition of the part.



Unilateral hypertrophy, showing enlargement of the entire leg and toe.

The hypertrophy is encountered more often in the male sex and on the right side. It interferes with the function of the affected part to a slight extent only. When associated with excessive fat formation, particularly on the plantar surface of the toes or foot, some difficulty may be experienced in walking, and if the hypertrophy becomes excessive the outline of the affected toes may be so distorted as to require surgical intervention.

The exact nature of the hypertrophy for a long time remained obscure because the histology of the affection was not known. Within recent years several exhaustive studies have been made which throw some light upon the question. The results of these studies will be briefly alluded to.

Busch described an irregular nodular enlargement of the epiphyseal end of the bone involved; the fat and marrow of the medullary canal was excessive in amount and the lamellæ of the compact bone was thin.

Hornstein in an autopsy of a case of unilateral hypertrophy noted absence of the thymus gland. On examination, the central nervous system, however, was normal. The hyperplastic process involved the fibrous and fatty tissues to the greatest extent and some hypertrophy was noted in the bone. The nerves were degenerated, the arteries were widened and the walls thickened.

Hoffman's case involving the first three toes showed a striking thinning of the compact bone, rarefaction of the spongy bone and fatty degeneration of the marrow. The periosteum and perichondrium were thickened. The epiphyseal ends of the bone showed increased ossification and also degenerative processes.

Wieland, in an exhaustive study, found a striking overgrowth of fatty tissue of the foot, although practically all the structures took part in the hypertrophy. The arteries and veins were dilated and thickened; the fibrous tissue, periosteum, bone and tendons also participated in the process. The skin and muscle showed atrophic changes due to pressure. The bone manifestations were of two varieties—hypertrophy and atrophy. To the hypertrophy is ascribed the increase in length and width of the bones; by the atrophic and retrogressive changes are explained its resulting fragility, the relatively small amount of lime salts, and the fatty degeneration of the marrow.

The changes seen in Wieland's case correspond closely to the microscopic picture in the case reported by the author.

To sum up the histologic picture of the cases of unilateral congenital hypertrophy, the factor of greatest importance seems to be the pronounced overgrowth of fatty tissue in the subcutaneous parts, a hyperplasia which, in some instances, has almost simulated a malignant formation. Associated with this overgrowth is a corresponding hyperplasia, but to a less extent, of all the tissues in the vicinity. Some atrophy of skin or muscle due to pressure may occur. The changes in the bone may be described as a rarefaction accompanied by fatty degeneration of the marrow, and hyperplasia of the periosteum.

Many theories have been advanced in explanation of this affection. For many years the disease was believed to be closely identified with some occlusion of the vascular channels resulting in stasis, and hence hypertrophy of the tissues from increased nutrition. The frequent association of telangiectases and nevi supported this theory. The vascular obstruction has been ascribed to intrauterine inflammation, vasomotor disturbances and other factors. According to Greig the vasomotor nerves undergo an incomplete paralysis so that the circulation is slowed; congestion, followed by hypertrophy, results. He admits there is no reason why this paralysis should occur or why it should be unilateral. As has been pointed out, the hypertrophy follows the distribution of certain nerves, so that Greig believes we must look for the cause of the condition in a central irritation of certain nerves by intrauterine meningitis or cerebritis. Hypertrophy of the head is associated with mental deficiency in 20 per cent. of the cases; the hypertrophy of the extremities has other associated deformities such as clubbed foot, webbed fingers, tumors, nevi, etc., indicating a perversion of the normal development. In hypertrophy of parts other than the face or head, the meningitis or neuritis would be limited to the spinal cord, and in these cases cerebral symptoms are absent.

The theory most likely to be true, according to Wieland, and one most adapted to the complicated morphology of the disease, is that of an embryonal malformation. The presence of a rich but defective cellular anlage in certain portions of the body, caused by congenital errors, explains the participation of all the tissues in that part in the abnormal growth. All varieties of hypertrophy may result from the different behavior of these misplaced cellular collections. With exhaustion of their proliferative energy at the time of birth the simple varieties of partial gigantism are met with. By continuous or intermittent proliferative processes in these anlage, during intrauterine life, the more severe types of congenital hypertrophy arise.

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GUAIACOL POISONING BY ABSORPTION, WITH REPORT OF A CASE.*

BY L. A. SEXTON, M.D.,
Willard Parker Hospital, New York.

As a member of the profession I feel it my duty to call attention to our experience with guaiacol as a local application in the treatment of scarlatinal arthritis.

The value of guiacol as a local anesthetic has long been recognized, and it has been for this purpose with its power to relieve pain that it has found its way into the treatment of painful and swollen joints from whatever cause.

Guaiacol, which is the chief constituent of beechwood tar, is that portion which distills over between 200° and 205° C. and is subsequently purified, or it may be prepared synthetically from catechol by methylating or from orthoanisidin by diazotizing and boiling.

Case Report.—D. J., aged three years, admitted February 10th, with a moderate case of scarlet fever.

Child well developed, well nourished, heart, lungs and kidneys negative. Temperature, 102°; pulse, 140; respiration, 34. The temperature came down gradually, reaching normal on the seventh day of the disease and remained normal until March 4th, when he developed a double cervical adenitis.

On March 10th he developed a severe otalgia. Myringotomy was performed and followed by a profuse purulent discharge from his right ear. On March 12th his urine for the first time showed a faint trace of albumin and a few granular and epithelial casts. He complained of pain in his right knee, right elbow and wrist. This continued until the 19th, when his urine became negative, the cervical adenitis subsided, and the discharge from the right ear ceased. The arthritis continued, however, and was very painful and the joints were swollen and tender.

On the morning of the 21st his painful joints, viz., his right knee, elbow and wrist, were painted with a 50 per cent. solution of guaiacol in glycerin. I will state here that this mixture had been used previously with no bad results and had seemed in many cases to allay the pain. No change in the child's condition was noted until the following evening, when the pulse became rapid and weak, the patient became cyanosed, and vomited all nourishment taken during the night. Large quantities of dark brown urine were voided and it was thought the child had suddenly developed a severe nephritis engrafted onto former attack, so he was treated accordingly. The joints were again painted on the morning of the 22d with the guaiacol mixture.

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* Read before the Section on Pediatrics, New York Academy of Medicine, February 12, 1914.

I saw the child at 8:20 the same morning and made a diagnosis of acute guaiacol poisoning from absorption. The patient at that time was vomiting and very restless, the cyanosis had given place to a deadly pallor, which became more and more cadaveric in its appearance, the restlessness increased, the pulse became imperceptible, the respiration rapid and shallow, the child's face became more anxious, the pupils were widely dilated and the child died at 8 P.M., just thirty-four hours after the first application.

The mixture used on the child, also several specimens of the guaiacol, were subjected to a thorough examination by the chemical laboratory and were found to be chemically pure. The urine smelled strongly of guaiacol and responded to the chemical tests for same.

Color of urine, black; reaction, acid; specific gravity, 1,018; albumin, negative; sugar, negative; indican, negative; blood and hemoglobin negative, both chemically and with spectroscope; microscopically, negative.

RECTAL INTUBATION.—We wonder how many of us have passed a finger into the bowel to find out just how far the tip of a rubber tube has ascended. Usually it will be found about one inch above the anus, for the tube simply coils on itself. Mechling (*American Journal of Surgery,* November, 1913) points out that the obstruction is due to the folds of mucous membrane, rectal valves, or the pelvi-rectal flexure. The term "high enema" is a misnomer and there is no enema except the low enema. To fill the colon up to the cecum it is only necessary to fill the rectum once or twice, allowing 16 ounces to flow in slowly with the help of retrograde peristalsis or gravity—which of the two is the agent is not definitely known.—*The Universal Medical Record.*

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held February 12, 1914.

DR. WILLIAM P. NORTHRUP, CHAIRMAN.

CONGENITAL MALARIA.

DR. MURRAY H. BASS read this paper. (See p. 251.)

DR. HERMAN SCHWARZ said that in examining the blood of children on account of anemia he had become interested in this subject. In studying the literature he found that a man from Edinburgh had reported 2 cases of congenital malaria and gave as one of his reasons for believing that the malaria was congenital "chills in utero"; this sounded a little far-fetched. This writer stated that he had found plasmodia in the blood of the infants soon after birth.

DR. FLOYD M. CRANDALL said that it certainly seemed strange if the congenital transmission of malaria was possible that it did not occur more frequently, still the evidence of the reader of the paper in the case presented was pretty positive and went to prove the possibility of such transmission.

In a case which he had reported many years ago, he believed in 1892, everything in the clinical history and findings seemed to give positive proof of the congenital origin of the disease. In this case the mother had had a paroxysm and the child had been born during the sweating stage. The following morning the child appeared to be all right. In the afternoon, eighteen hours after birth, it appeared blue and pinched and it was thought that the child was dying when he was sent for. He found that the child had a temperature of 102°F. The same thing occurred the following day, and the child had four successive attacks, each lighter than the preceding one. In those days they knew little of the plasmodia or of blood examinations, but he had attended a meeting where he had heard Dr. Walter B. James present a paper on the subject and he took blood cultures and had them examined on the third day and the plasmodium was found in the blood of both mother and child.

Dr. Crandall said that he did not see, all things being considered, how the case could be other than a congenital one.

Dr. Charles Herrman said that twelve years ago he had seen a case which he believed to be congenital malaria in the Italian colony in Harlem, known as "Little Italy." The mother had recently come from Italy and gave a clear history of malarial attacks. The baby was three weeks old. It did not have distinct chills, but had attacks of cyanosis followed by fever. Plasmodia were found in the blood and under quinin treatment the attacks disappeared. Although one could not be absolutely certain, the case was in all probability congenital.

Dr. William P. Northrup said that he recalled the case of a baby a few weeks old that had supposedly malaria. The child was given 10 grains of quinin and it lived.

TROPICAL DISEASES IN CHILDREN.

Major Frederick F. Russell, U. S. A., said that children's diseases in the tropics were very similar to those in this latitude, with a few noteworthy exceptions. Diphtheria, scarlet fever, mumps and whooping-cough were not common; measles was more often seen, and chicken-pox was quite prevalent. In most localities in the tropics small-pox was so general that it was practically a disease of childhood. The diseases more frequently met with were the diarrheas and dysenteries, eczema, furunculosis and prickly heat, malaria in all of its forms, infections with intestinal parasites, and, above all, syphilis, both acquired and congenital. In the far East they had also beriberi, yaws, and, at times, cholera and the plague. Infection with intestinal parasites from the practical point of view were the most important, not that they were directly the cause of serious diseases, but because of the harm to the general health. Tropical cities, with very few exceptions, were backward in sanitation and had much the same sort of infections that were noted here fifty or sixty years ago, before the cities of the north were provided with sewer systems. In the tropics the circuit followed by intestinal parasites from man to man was quite direct, owing to the custom of using human ordure as a fertilizer for green vegetables. The commonest worm was the *ascaris lumbricoides,* and almost every native up to middle life was infected. It was customary, as a routine measure, to administer santonin and calomel to children about twice a year. Although the worms produced no specific disease, when a child harbored two or three hundred of them the effect on the general health was considerable. A striking demonstration of the influence of helminths on the general health was clearly shown in the history of Bilibid prison in Manila. Here for years the death rate from all causes had been high and sanitary reforms had not brought about the expected improvement. Examination of the feces for ova showed the presence of one or more helminths in the majority of the prisoners. Following the general use of anthelmintics, the sick rates from all causes showed a remarkable improvement.

The most important nematode among children was the hookworm—*anchylostoma,* or *necator Americanus.* In countries where it was prevalent almost every child was infected and the children suffered in extreme degree from the resulting anemia and digestive disturbance. A point worthy of emphasis in regard to helminths was that the carrier state was frequently encountered absolutely without symptoms; this might be partly due to the development of immunity, but more often it depended upon the small number of helminths present.

Oxyuris vermicularis was rather more prevalent in the tropics than in the temperate zones. The tape-worms and flukes were also found, but the only one of importance was the dwarf tapeworm—*hymenolepis nana,* which occasionally existed in the most unbelievable numbers, producing a multitude of symptoms. This almost universal presence of helminths made the examination of the stools of more importance than the examination of the urine. It was absolutely necessary, therefore, to have some workable system of collecting and examining feces. The specimen need not be quite fresh unless examination was to be made for entameba. In Porto Rico the natives had been so instructed by Ashford that a patient seeking advice always took along a specimen of feces in a match-box. Aside from the strictly human parasites, those of the dog and the pig were frequently found in children, and this was not to be wondered at when one considered the mode of life of these people. The question of the prevention of infection and reinfection was important and involved the instruction of all families in personal hygiene. The duration of life of the parasites was short, one or two years at the most, and if reinfection could be prevented they would soon disappear from the tropics as they had from the north.

Malaria was of the greatest importance in children, both because they could not protect themselves from the mosquito, and because their thin and delicate skin made infection from the mosquito easier than in the adult. The prevalence of malaria in children gave an index to the amount of malaria in a district, as had been pointed out by Koch. The malarial index was readily ascertainable by noting the percentage of children with easily palpable spleens. All varieties of malaria occurred and the clinical course was more often atypical than not. For this reason relapse often followed relapse until the disease might well be called chronic. Examination of the blood for malaria must in the tropics be also a routine procedure.

Syphilis in the tropics, especially in the seaport towns, was extremely common, and compared to the disease in the north seemed quite mild and amenable to treatment.

Yaws, the younger sister of syphilis, was more interesting. It was a chronic, specific, infectious disease, characterized by an eruption of strawberry-like tubercles and more or less constitutional disturbance. The West Coast of Africa was probably the original home of the disease, from whence it was carried to the Spanish Indies by negro slaves. It was caused by the *trepanema pertenuæ* of Castellani, an organism morphologically indistinguishable from the spirochete of syphilis. It had been shown, however, that yaws was a distinct disease entity and not a form of syphilis. The most interesting point about the disease at present was its successful treatment by salvarsan, one dose usually bringing about a complete cure; in fact, the results obtained by salvarsan in yaws might be said to surpass those obtained by that remedy in syphilis. Since the introduction of treatment by salvarsan into the yaws hospitals in the West Indies, these institutions, which had been crowded with patients for hundreds of years, were now for the first time closed.

One of the most interesting and important diseases of the East was beriberi, and for years an infantile form of this disease had been recognized in breast-fed infants. Beriberi was a disease of metabolism associated with a deficiency of certain unknown elements of the food and characterized clinically by multiple neuritis, dropsy and tenderness, wasting and paralysis of the muscles, including the heart muscle. The symptoms of a typical case were about as follows: A young infant two or three months of age, previously healthy and well nourished, was suddenly seized with paroxysms of pain, during which it straightened out its body and became rigid; the abdominal walls and epigastrium became tense and hard. The child cried constantly, the face became cyanosed, and the veins of the neck turgid. The pulse was small and hard. The paroxysm passed off only to recur again and again until death supervened, which was usually within a few days or hours. A chronic form of beriberi was seen with gradual onset and sudden termination. At autopsy the same lesions were found as in adults. There was extreme dilatation and hypertrophy of the right heart, hydropericardium, degeneration of the vagi and of the cells of the right cervical ganglion, and, in most cases, extensive subcutaneous edema. The singular point about this disease was the high mortality among breast-fed infants. In 1909 65 per cent. of the infant mortality of Manila was among breast-fed children and only 20 per cent. among those artificially fed. Fifty-six per cent. of the total infant mortality of Manila has been caused by this disease. It had been shown that beriberi was caused by highly-milled white rice, and this fact gave the key to the treatment of the disease in children. An alcoholic extract of rice bran was prepared and fed to the children, the breast feeding being continued. The improvement under this treatment was marked and immediate; vomiting stopped within twenty-four hours and the pain and sleeplessness disappeared. At the end of a week or less the patient was practically cured. Chamberlain and Vedder had demonstrated conclusively that beriberi was not an intoxication, but a deficiency disease. Its eradication was now a matter of time only, and of educating the rice-eating peoples to select the proper sort of rice.

Tetanus was extremely common everywhere in the tropics; indeed, it was so prevalent that one had to guard against it even in giving a hypodermic of morphin.

All the bacillary forms of dysentery were also very common; they presented the same symptoms and the same organisms seen in this country. Amebic dysentery was met with, but not so commonly.

Bilharziasis infection was common in China, Japan and the Philippines. The principal habitat of the worms was the portal vein, from whence they descended to the rectum and the bladder and worked their way through the intestinal walls, thus producing lesions which sooner or later proved fatal. There was no known efficient anthelmintic for these parasites.

The *strongyloides* was very prevalent, but was of no importance except as an indication of the hygiene of the people.

Kala-azar was found in both children and adults and was characterized by great emaciation, enlarged spleen and liver, great reduction in the number of the white blood cells as compared with the red, and often by edema of the lower extremities. It ended fatally. The parasite causing the disease was known as the *leishmania donovani,* and as the life cycle of this organism was now known it might be possible to control the spread of this disease.

In bubonic plague in children the bubo was usually found at the neck, but it might appear in the femoral region, at the elbow, the wrist or elsewhere.

A new interest had been awakened in amebic dysentery since the introduction of emetine. After five or ten doses of emetine administered over four or five days, there was usually an apparent cure, but most of these cases relapsed. In a patient who was gaining and had normal movements one frequently found enormous cysts in various stages of development. These cysts were found in apparently normal stools and developed four nuclei. As long as they persisted treatment must be continued if a permanent cure was to be effected.

Major Russell illustrated his paper by an interesting lantern-slide demonstration.

DR. WILLIAM P. NORTHRUP said that the paper had been exceedingly interesting and that he had been especially interested during the reading in noting the resemblance of beriberi to scurvy.

DR. W. T. LONGCOPE said that he should like to know how the diagnosis of the cyst form of the ameba in the stools could be made with certainty. In the fresh state there must be considerable difficulty in differentiating the cyst forms from the epithelial cells, and since it was possible that these encysted amebæ might be present in certain unexplained cases of chronic diarrhea in this locality, it seemed important that we should know exactly how the diagnosis of these forms might be made.

DR. MAJOR FREDERICK F. RUSSELL replied that the diagnosis of the cysts of amebic dysentery was not difficult if one used the staining methods of Schaudinn. Of course it took some experience, but no epithelial cell had a nucleus like that of the cysts. The nucleus of the epithelial cell was larger and never multiple, while the cyst of amebic dysentery might have as many as four nuclei.

PELLAGRA IN CHILDREN.

Dr. J. W. MacNeal, in the absence of Captain Joseph F. Siler, gave this talk and exhibited charts and lantern slides illustrating the work of the Thompson-MacFadden Pellagra Commission. He declared that pellagra was not a very important cause of serious illness or of death in children, but the common occurrence of this disease in children was a very important feature of the general problem of pellagra.

With regard to the manifestation of the disease in children, he said there were three points to be considered—the skin lesions, the gastrointestinal symptoms, and the nervous manifestations of the disease. The skin lesions were similar to those that occurred in the adult. The gastrointestinal symptoms, pain and acute or subacute inflammation of the digestive tract, were found in children as in adults. The involvement of the nervous system, however, was not so marked in children as in adults. One seldom saw the toxic psychoses that were so often met with in adults. In showing the illustrations of the lesions, Dr. MacNeal called attention to the tendency of the lesions to girdle the wrists and said that the statement had been made that when this occurred the patient would die. He also called attention to the bilateral symmetry of the lesions, and to the fact that they were more extensive where the skin were exposed to the sunlight. While the sunlight seemed to aggravate the skin condition, its absence did not inhibit the progress of the lesion, but only delayed it. In children the feet were more commonly involved than in adults. When the lesions ceased to progress there was an increase in the severity of the gastrointestinal condition and of the general toxemia.

Dr. MacNeal said he would not confine himself to the discussion of pellagra in children, but would consider the general subject.

In a population of 6,600 people in endemic foci of the disease in South Carolina, there were 882 females and 1,005 males under ten years of age. During the two years, 1912 and 1913, there developed in this population 91 new cases of pellagra, and of these 23 occurred in female children and 25 in male children. A statistical study of the food used in six villages, including about 5,000 persons, failed to reveal any consistent relationship between the use of any particular food and the occurrence of pellagra. A somewhat similar study of the location of domicile of old cases of pellagra in relation to domicile of the remaining population in these mill villages had shown that the new cases of pellagra developed almost exclusively in persons living in the same house with such antecedent cases or in houses next door to them. In more than one-half the instances of next-door relationship a child under the age of twelve years was involved either as the antecedent or the incident case. The disease spread, therefore, from a preceding case as a center, a phenomena that could be satisfactorily explained in their opinion only by assuming that pellagra was an infectious disease. Apparently it was not readily transmitted to any considerable distance. In the transmission from family to family the children seemed to play an important part.

Dr. William P. Northrup said that the reference to the saying that when the lesions of pellagra encircle the wrist the patient was going to die reminded him of some of the first information he had had about shingles in his student days. It was said that if the shingles went all the way around the body the patient would die; as a matter of fact they never did go all the way around.

Dr. W. T. Longcope said that he felt that he had learned more concerning pellagra during the evening than he had ever known before. Dr. MacNeal's interesting and clear presentation of the work of the Commission and the charts and slides, that represented so much careful work, truly put the position of the whole subject in a new and absorbingly interesting light. Before hearing this report it had occurred to him, as probably to many others, that there were many points of close analogy between beriberi and pellagra, but this idea had been entirely dispelled by Dr. MacNeal's convincing presentation. Certainly this work left little basis for the old assumption that pellagra was associated with the ingestion of spoiled corn. Dr. Longcope asked Dr. MacNeal whether one would be justified in making the diagnosis of pellagra when skin lesions did not exist, and also whether he had observed the development of pellagra in suckling infants.

Dr. Alvah H. Doty said that his experience with pellagra was limited and that he had learned more to-night than he had before known regarding this disease. He had always believed that pellagra, like beriberi, was due largely to improper food and malnutrition. While malnutrition might not be a factor in the early stage of the disease, he thought it played an important part as the disease advanced. All would be interested to know the true origin of the disease.

Dr. William P. Northrup asked about the popular beliefs regarding the disease. What were the opinions of the people?

Dr. W. J. MacNeal, closing the discussion, said he did not know whether he could answer all the questions asked, but he would make the attempt. If he should omit anything he should be pleased to have the question repeated, inasmuch as he had not made written notes of the discussion.

As to the diagnosis of pellagra without skin lesions, in the work of the Thompson-MacFadden Commission no cases were accepted as definite pellagrins unless the skin lesion had been observed either by themselves or by a local physician. Skin lesions might be present in a typical form for only a few days in some cases, so their absence did not negative a diagnosis of pellagra. Cases often went for months without skin lesions and one could not exclude pellagra just because the skin lesions had not been seen.

In regard to the question of an insect carrier or a secondary host of the parasite of pellagra, this subject had been carefully studied by Mr. A. H. Jennings and Mr. W. V. King, of the Bureau of Entomology, United States Department of Agriculture, working in collaboration with this Commission. Dr. Sambon, of London, had stated that pellagra was contracted chiefly by field workers and he had incriminated the buffalo gnat (*simulium*) in its transmission. Jennings and King observed that the disease was contracted chiefly by persons remaining in or about the dwelling house in the daytime and they had suggested that the stable fly (*stomoxys calcitrans*) might play a rôle in its dissemination. The evidence, however, was inconclusive.

The methods used for the disposal of sewage seemed to have something to do with the spread of pellagra. In those portions of the city of Spartanburg equipped with a water carriage sewer system, relatively few cases of pellagra developed, while in those parts of the city where surface privies were used there were many more cases of this disease. The relationship was suggestive, but not clear-cut, for even in the sewered districts some houses were still provided with surface privies. In order to get more definite observations on this point an attempt was made to find mill villages with complete water carriage sewer systems. With the assistance of the State Board of Health three such villages were located. At one of these the sewer system had been in operation but one year, so it seemed of no value for this purpose. In the second village the water carriage sewer system had been in use for three years and during that time no new case of pellagra had originated there. In the third village the water carriage sewer system had been in use for twenty years. A number of cases of pellagra had moved into this village from time to time, but no new cases could be proven to have originated there. In one of the visits to this village the Commission was accompanied by Dr. Sambon, and after examining the situation he agreed with this conclusion.

In regard to the treatment of pellagra, no specific was offered, but very good results had been obtained in several cases. The important therapeutic measures included removal of the patient to a cooler climate or the provision for comfortably cool temperature in his room, careful but full feeding with plenty of milk and eggs, scrupulous cleanliness, efficient nursing and cheerful optimism on the part of everyone around the patient. Fourteen cases of pellagra brought to the New York Post-Graduate Hospital in 1912 were treated along these lines and all of them recovered from the acute manifestations of the disease, although most of them relapsed the following year after returning to their previous environment. In 1913, observations were made upon the treatment of a number of cases in a hospital in the South. Different methods of specific treatment were tried on these cases, but several deaths occurred nevertheless. Personally, Dr. MacNeal was opposed to the use of arsenic or other supposedly specific treatment during the active stage of the acute attack, but this opinion was not shared by the other members of the Commission. Salvarsan had been used in treatment, but there would seem to be no real justification for its employment.

In reply to the question as to whether he had seen any cases of pellagra in suckling children, Dr. MacNeal said he had not seen such cases. Such cases had been reported on reliable authority, however. Among the cases on the records of the Thompson-MacFadden Pellagra Commission there was none less than one year of age.

THE PHILADELPHIA PEDIATRIC SOCIETY.

January 13, 1914.

THEODORE LE BOUTILLIER, M.D., PRESIDENT.

TUBERCULOSIS CLASS.

DR. MYER SOLIS COHEN described his class of 24 children at the Philadelphia Jewish Sanatorium for Consumptives at Eagleville, Pa. He quizzes the children as well as instructs them, and has the little patients give talks on how to get well and keep well and how to avoid infecting others. Emphasis is laid upon the hygienic life that must be followed after the patient returns home in order that the recovery may be permanent. The children are urged to preach to their families and friends the gospel of proper living. Instruction gained in the class will tend to prevent or diminish the usual relapses due to return to an unfavorable home environment and will render more lasting the benefit obtained at a sanatorium. In answer to a question by Dr. A. H. Davidson, Dr. Cohen said that the children must know why they use separate paper handkerchiefs, sputum cups, etc., so that they may realize their danger to others; therefore this education is of great value. The paper in full will appear in a later ARCHIVES.

NERVOUS DISORDERS OF CHILDHOOD.

DR. T. H. WEISENBURG, by invitation, showed cinematograph pictures of the following cases: Jacksonian convulsions, 3 cases, 1 limited to arm and face, 1 to right side of face only and 1 to face only; a whole series of cases of so-called idiopathic epilepsy, in which most of the fits were tonic and not clonic; spasmodic torticollis; many cases of idiocy and imbecility, showing cases of microcephalus, hydrocephalus, rocking movements and other mannerisms so common in these defectives; hemiplegia; a series of cases of infantile diplegia with athetoid movements; a series of cases of paralysis agitans; tabes dorsalis, also showing Fraenkel movements; a number of cases of cerebellar tumor with different cerebellar symptoms, nystagmus, etc.

DR. W. N. BRADLEY asked about the mental condition of the children with Little's disease.

Dr. Weisenburg said that Little's disease originally included only infants born prematurely, at seven months. He had never found one of these infants normal so far as the nervous system was concerned, even when seen late in life. He referred to a medical student who came to him with the statement that he was a seven months baby, but was normal; in this man "petit mal" existed without his knowing it. Pathologically there is always some lack of development in the nerve tracts, because the infant was not in utero long enough to complete development. In answer to Dr. O'Hara's question, Dr. Weisenburg stated that it was his belief that the so-called seven months infants who turn out to have normal development are really older, for one cannot be certain of the exact intrauterine age.

Dr. Frederick Fraley said that many congenitally spastic infants give a positive Wassermann reaction. He asked Dr. Weisenburg what percentage of the children at Spring City gave a positive Wassermann, either with the blood or the spinal fluid.

Dr. Weisenburg stated that no Wassermann reactions have as yet been made at Spring City, but a laboratory was soon to be started. In some of the children seen with a spastic condition of the limbs, later in life, there may be a family history of a spastic condition, or it may be the result of some birth accident.

Dr. Bradley said that he believed that a large number of the infants with spasticity were not syphilitic, but that this condition was often due to prolonged labor, with resulting injury. It is not a result of the use of instruments as a rule. Dr. Bradley has observed many babies, born at seven or eight months, in whom no symptoms have appeared as yet.

Dr. J. H. McKee referred to a newborn baby which he had recently seen in consultation.

Dr. Weisenburg added that he considered all seven months infants, having a spastic condition of the limbs, as having Little's disease.

Dr. Le Boutillier asked whether Dr. Weisenburg would expect a baby, who had had convulsions in infancy with some intestinal affection, to develop idiopathic epilepsy later.

Dr. Weisenburg referred to a baby less than a week old, which had typical Jacksonian epileptic attacks, in which recovery followed the passage of a large mucous intestinal cast. This was the only case of "reflex convulsions," of distinct and complete epileptic type, in which epilepsy had not followed, that Dr. Weisenburg had ever observed. Dr. Weisenburg added that he believed that infants in whom complete epileptic convulsions occur, from so-called reflex causes, have idiopathic epilepsy and will have more attacks later in life.

Dr. E. E. Graham discussed reflex convulsions. He believed that a convulsion in an infant was likely to injure the brain. In some of these cases true epilepsy may follow later.

Dr. D. J. Milton Miller, of Atlantic City, N. J., believed that the statement of Dr. Weisenburg, that whenever complete epileptic convulsions occur in infants epilepsy will follow, was probably correct, for the usual convulsions of infants is incomplete. Dr. Miller referred to a severe case of colitis, with convulsions, which were repeated over the period of a week, with high temperature. These convulsions were never complete, as seen in the classic epileptic fit of the adult, but consisted of stiffening of the body, temporary cyanosis and slight twitching and were accompanied by high temperature, as are most convulsions of infancy.

Dr. McKee referred to the occurrence of syphilis in such infants, quoting from James Taylor's classification.

The President then delivered the Annual Address.

THE PHILADELPHIA PEDIATRIC SOCIETY.

February 10, 1914.

William N. Bradley, M.D., President.

DIAGNOSTIC LAMP.

Dr. Howard Reed demonstrated a device consisting of a flash-light with an attachment securely riveted to the under side to hold a wooden tongue depressor.

PSEUDOMEMBRANOUS LARYNGITIS, NON-DIPHTHERITIC.

Dr. Eleanor C. Jones showed a cast of the lower part of larynx and upper part of trachea from a boy of thirteen and one-half months. Autopsy showed this cast-like material to line the entire trachea, lower larynx and bronchi as far as it was followed. It was white and fibrous above; soft and mucoid below. There was no membrane in the pharynx or on the tonsils. Beginning bronchopneumonia was found in the lungs. Cultures from the throat and smears from the secretion in the trachea showed pneumococci, micrococci catarrhalis, Gram negative staphylococci, but no Klebs-Loeffler bacilli. The clinical diagnosis was laryngeal diphtheria, until corrected by the laboratory. The site for the diphtheroid membrane is unusual, and the organisms found were mainly pneumococci. The suprarenal glands were very pale, confirming the non-diphtheritic diagnosis.

Dr. B. F. Royer, of Harrisburg, said that he has frequently found cultures positive, if taken from the lower end of the intubation tube when removing it, even though no positive cultures had been obtained from throat or vicinity of the larynx previously. Non-diphtheritic membranes are more commonly due to pneumococci than to streptococci. Dr. Royer also referred to a case of tracheal and bronchial diphtheria, the patient dying upon the operating table in Jefferson Hospital, and the specimens being in the museum of that institution, where a complete cast of pseudomembrane began at the third tracheal rung and extended throughout the smallest bronchi. The diagnosis was only made at autopsy.

Dr. Jones, in answer to Dr. McKee's question, said that no blood cultures had been made, nor had antitoxin been given.

TUBERCULOUS PERITONITIS.

Dr. J. H. McKee showed the omentum from a case of tuberculous peritonitis.

QUARANTINING HOSPITAL WARDS FOR MEASLES.

Dr. E. E. Graham desires the present quarantine regulations for measles modified, if possible. He considers measles very contagious, the contagion lasting from the earliest catarrhal symptom to the fading of the rash. Fifty per cent. occur during the first five years of life; 40 per cent. in the next five years. All children, almost invariably, if not protected by a previous attack, contract it. It is dangerous in the very young and delicate infant. There is little danger in robust children over four years, if properly treated. Eighty per cent. of deaths occur in children under five years. The contagion is short-lived outside the body. It is a contact disease and is less likely to be carried by a third person than is scarlet fever or diphtheria. Second attacks are rare. By closely watching exposed children, Koplik's spots can usually be detected from one to three days before the rash, and the child removed before it becomes a very active source of infection. Measles occur in epidemics separated by periods of two, three or four years. All exposed children in schools and communities contract it and the epidemic ceases, only to reappear when a large number of children, not previously exposed, are again affected in a fresh epidemic. During an epidemic cases of measles are apt to occur in all wards to which children are admitted. Consequently these wards are often quarantined for from two to six weeks. At the same time it often happens that other hospitals for children are also quarantined, and it may be impossible for a child dangerously ill with some acute disease to be admitted to a hospital. Dr. Graham's idea is to reduce the number of patients in the ward as rapidly as possible, transferringing them to a small ward. If the parents wish to take a child home, ought we not to allow them to do so, provided the child is over four and can secure good medical attention and nursing at home? The names of such children should be given the Board of Health. If a child is convalescent and has had measles previously, ought we not to send that child home without consulting the parents? It will not carry the disease and it is well enough to leave the hospital. If the child is an only child it should be sent home, whether it has had measles or not, if over three years and with good home conditions. Other children in the ward should be kept in strict quarantine in a small ward for fourteen days after the eruption appeared in the measles case. The large ward should be scrubbed, fumigated and immediately put into use. If a child over four years, who has already had measles, should apply for admission, acutely ill, it should be admitted, the parents being informed that it will be exposed to measles. It would be best to have all beds in the wards separated by glass partitions; then, when measles occurs, remove the measles patient, also the child on either side of it; scrub the ward over a space of 20 feet around the case, and continue admitting children to the ward. In a children's ward all beds ought to be separated by glass partitions; every child should be examined daily for Koplik's spots, coryza, rash and fever; and suspicious cases should be immediately isolated. Resident physicians should learn to recognize measles before the rash is fully developed. In taking the history, previous illnesses and possible recent exposure to any contagious disease should be noted. Each patient should have his own thermometer, bed-pan, wash-basin, etc.

HOSPITAL TREATMENT OF MEASLES.

DR. MATTHIAS NICOLL, JR., of New York, said that the attitude of the public toward measles depends on the environment and occupation of the persons affected by the presence of the disease. In a private house it is commonly regarded as little more than a hindrance to social activity; in the private school, hotel or apartment house, a nuisance; in the tenement, a grave misfortune, and in institutions and hospitals, a calamity. The death-rate from measles is difficult to determine, as it is unquestionably true that many cases are not reported. In 1911, in New York City, 25,540 cases were reported, with 785 deaths; only 2,078 of these were treated in the hospitals of the Department of Health, with 161 deaths, giving a death-rate of 3 per cent. for outside cases and 8 per cent. for hospital cases. During the past year, among 29,163 cases reported, the respective death-rate was somewhat lower, the proportion between hospital and outside cases being about the same. The Riverside Hospital is situated on an island in the East River, patients being transported in a special hospital boat, taking three-quarters of an hour for the trip. Only "straight" measles or measles with diphtheria are treated. There are several good-sized one-story pavilions, containing several wards of six to eight beds, which can be fairly well shut off from one another in cases of mixed infection, which, if they arise, are promptly removed to their appropriate pavilion. Great care is taken to keep these wards cool and well-aired. During 1913, 1,150 measles patients were admitted, 948 of whom had straight measles, while the others were complicated by some other infectious disease, mainly diphtheria; 63.3 per cent. of patients were five years old or less; nearly 40 per cent. were sent from hospitals or institutions; 39 cases of scarlet fever and 12 cases of diphtheria developed in the wards, and 7 cases of both; 196 cases had bronchopneumonia on admission and 42 developed it later; 27 cases were intubated for laryngeal diphtheria. The percentages of fatal cases were as follows, excluding 15 cases who died within forty-eight hours; Straight measles, 6.96 per cent.; all cases, 9.3 per cent., compared with 30 per cent. in 1908, 13 per cent. in 1911, and 9.25 per cent. in 1912. The great mortality in previous years was largely due to treating cases in a single building containing a few large wards, badly overcrowded, with inefficient isolating facilities, for cases of mixed infection. Through careful bacteriologic work and the isolation of infected cases, together with strictest precautions against spreading the disease, only 15 cases of vaginitis occurred, compared with 90 cases a few years ago. Dr. Nicoll described the new measles building, not yet occupied, constructed so as to give a maximum of light and air, with ample provision for the immediate shutting off of wards in which mixed infections occur and facilities for treating them in absolutely separate rooms. A case of measles in such a hospital should have as good a chance of recovery as if left in the home, which is at present not the case. A measles hospital is an absolute necessity in a large city, unless all general hospitals provide for treating measles when it arises, and certain hospitals provide for measles cases which cannot be properly cared for at home or are a menace to those about them. Until the city provides a measles hospital, the Health Department is justified in its present attitude, removing from homes and institutions only such cases as must be moved, for their own benefit or for the safety of those about them. It would seem that the Health authorities would be more likely to act on Dr. Graham's suggestions, if the changes in regard to separating patients from one another in the wards were first carried out.

Dr. H. H. Doan said that measles may be taken as the type of a contagious disease, being most readily communicable, exceeding even small-pox in this regard. As a cause of death it ranks high among the acute fevers of childhood. The period of incubation, nine to eleven days, is almost constant, the rash appearing on the thirteenth or fourteenth day after infection almost uniformly. It is considered a disease of childhood only on account of the chances of exposure in early life. When introduced into the Faroe Islands in 1846, 6,000 of a population of 7,700 were stricken; in 1775, in the Sandwich Islands, 40,000 of a population of 150,000 died. It is common in army camps among troops from the country, exposed for the first time. It is usually transmitted directly; it is extremely doubtful if measles is at all contagious after the temperature has fallen. As it is highly communicable and is infective from the pre-eruptive stage, its suppression is most difficult. Isolation is quite worth while. Physicians should always wear gowns on entering the sick-room, as it is possible to convey measles by a third person. When a case is reported to the Bureau of Health a medical inspector visits the premises, secures a history, placards the house and excludes all inmates in any way associated with institutions of learning, from school. For those remaining at home, this period of exclusion is three weeks. Should a school child take up residence in a house where there are no children he may return to school in two weeks. Should no other cases occur on the original premises the placard is removed in two weeks and seven days later the children are returned to school, after having been seen by a medical inspector. Fumigation is not required. Should a case of measles develop in a hospital ward, it is removed to the Philadelphia Hospital or kept at the hospital in which it occurred, as other cases will most surely develop, and it is not a good plan to disseminate the disease by discharging exposed children, possibly establishing a number of foci. The ward is then kept under quarantine for two weeks.

Dr. A. A. Cairns spoke of the mandatory character of the law. He admitted that he considered the present law too drastic. The child with measles is held under observation for three weeks after the report of the disease reaches the office of the Board of Health. The placard is up fourteen days; children, teachers and other persons connected in any way with schools are excluded from school for three weeks.

Dr. Royer disagrees with the statement that measles is only contagious until the rash has faded. He has seen cases which were undoubtedly contagious after acute catarrhal symptoms had disappeared and the rash had entirely faded. He believes that the infecting agent lingers a long time in the nasal and oral discharges. He referred to a child isolated for one month because of a discharging ear and fourteen days after this child was returned to the wards, all other sources of infection being ruled out, an epidemic followed, resulting in several deaths. It should not be decided hastily to change the twenty-one-day quarantine period to fourteen days. Because Anderson and Goldberger failed to infect monkeys after the rash had disappeared by no means proves that the patient with measles is not infectious until some days later. The State Department of Health, so long as Dr. Dixon is at its head, will favor reducing the quarantine period of measles to fourteen days or less, just as soon as sufficient clinical and experimental evidence accumulates to justify asking the Legislature to reduce the period. It may even be found that children whose physicians will certify that they have had measles may safely be allowed to continue school attendance from homes under quarantine for measles, provided that the patient is carefully isolated. Dr. Graham's suggestion that the infected patient's bed-fellows on each side be isolated and the immediate section of the ward scrubbed up, reaches but a small part of the trouble; there is always danger that nurse and doctor may have carried measles infection up and down the ward because of failure to wash their hands between cases. The cubicle system will be successful in direct proportion to the rigid observance of technique of hand disinfection by nurses and doctors. Low temperatures seem to destroy the contagion of measles. It is rare for infection in institutions to jump across cold corridors, even though attendants come from infected rooms through the cold current of air directly into non-infected rooms. Disinfection of some sort must be practiced at the conclusion of the quarantine for measles in order to comply with the laws of this commonwealth, and health authorities must certify to such disinfection prior to allowing children to return to school.

Dr. J. P. Crozer Griffith was glad to hear measles spoken of as a serious disease. It is very contagious, and is most severe among children under five years. As in quarantine we give up personal liberty for the public good; we should determine just what is necessary in every case. With care, a third person ought not to be able to carry measles. Dr. Griffith believes that children who have had measles should be allowed to attend school when isolation is good. He also believes that the quarantine period could with safety be reduced to two instead of three weeks. The contagion is usually spread before we know that the child has measles at all.

Dr. Randolph Faries spoke of personal experiences in his own family. His 3 children had measles fourteen days apart, the last contracting the disease twenty-eight days after the first. Each was rigidly isolated with a nurse. He called attention to an atypical case in a child of sixteen years, with catarrhal symptoms appearing two days after the eruption, and he mentioned a case in which the rash decidedly resembled small-pox.

Dr. R. S. McCombs asked whether there were to be private rooms in the new Measles Hospital. He referred to a case which broke out in a young man in a hotel, this case finally being removed to the isolation department of the University Hospital, since he could be taken nowhere else.

Dr. D. J. Milton Miller, of Atlantic City, N. J., spoke of the unnecessary hardship dependent upon the present regulations of the Board of Health. Measles is certainly not infectious very long. The greatest hardship is placed upon the children of a family who have had measles. They should be permitted to attend school. In former years measles was regarded as not quarantinable; it was considered inevitable that the whole family must get it. We know that it can be as well quarantined as scarlet fever at home. As to the incubation period, Dr. Miller studied several cases carefully, finding that the incubation period was just eleven days.

Dr. Nicoll added that while regulations of the health authorities seemed at times unnecessarily severe, until some definite conclusion had been reached by pediatrists and others of authority in regard to the incubation period of the disease and length of time of its transmissibility, it was the duty of the medical profession of every community to see that all sanitary laws, even though arbitrary in some instances, were obeyed. Personally he felt that clinical and experimental evidence pointed to a period of infection of not much longer than a week from the beginning of symptoms and that, therefore, the recent reduction of the length of quarantine in the city of New York from three to two weeks was conservative and founded on good sense.

Dr. M. N. Hartzell said that the efficiency of isolation depends upon its completeness. When measles occurs in a hospital ward, where there are as yet no glass partitions, the case affected must be removed at once. The individual must at times suffer for the public good, in cases of quarantine. If we could tell exactly how long a case was infectious we could make a quarantine fit a disease. But, not knowing this as yet, we leave a reasonable margin to cover all possibilities, in making the quarantine. You can never control a contagious disease when the public considers the disease simply a joke, as they do measles. Therefore many cases of measles are not reported; in many houses no physician is called. The mother limits the period of quarantine to suit herself. Parents should be fined, if necessary, for not reporting cases of contagious disease in their own families. In hospitals it frequently occurs that insufficient questions are asked about conditions in the neighborhood from which each patient comes. This would prevent the introduction of measles into a general hospital.

Dr. Clarence W. Schaeffer spoke of the management of measles in a hospital. When a case of measles does get into a ward the first sneeze infects all the children. He reported a series of isolation experiments by which he was able to prevent a whole ward from contracting measles.

Dr. Graham hoped that, as no serious objection had been raised to his suggestions, they would be considered by the Philadelphia Board of Health. Dr. Royer's belief that the contagion persists after the entire fading of the rash is not a serious objection, as the quarantine always continues for some days after the rash has faded. He agrees with Dr. Hartzell that the original case of measles should always be immediately removed from the ward, which is invariably done. The ideal ward for treating contagious diseases is the one Dr. Nicoll suggests. The Philadelphia Hospital has two such wards, where mumps and chickenpox are treated. Each pavilion consists of several small rooms holding one, two or three patients. A sheet is hung in front of each door, a gown worn by physician and nurse, and unnecessary handling is avoided. Patients rarely contract a second infection while there. Dr. Graham asked Dr. Nicoll, in view of the fact that bronchopneumonia is often associated with a streptococcic infection, whether he had used antistreptococcic serum. He also asked whether he found the tuberculin test positive after measles; would he isolate a case of bronchopneumonia occuring in a ward with other measles cases.

Dr. Nicoll said that he had found the pneumococcus associated usually with the streptococcus to be the chief agent in secondary pneumonia of diphtheria, and he presumed the same would hold true in measles. He had not used serum in cases of measles with bronchopneumonia. Fresh air is important in the treatment of these cases. In measles the von Pirquet tuberculin test is frequently absent during the active stages of the disease, to reappear later on, a very suggestive phenomenon in view of the well-known fact that the resistance of tuberculosis is lowered during an attack of measles.

Dr. Cairns added that he was much pleased to hear Dr. Griffith speak of the seriousness of measles. In ten years we have had over 1,700 deaths from measles among children; most of these died from pneumonia. But we cannot change these laws, which were the result of much deliberation upon the part of both Dr. Neff and Dr. Dixon. High school children do suffer by being excluded from school because a young sister had measles, when they had had the disease long before. Dr. Cairns would like to be able to decide what seems best in each case, provided he could secure evidence that the other children had already had measles. He dislikes closing a hospital ward, but he has to close each ward in which a case of measles breaks out for fourteen days after the child has been removed. He believes that the new hospital for measles is to have private rooms in it.

Hirschsprung's Disease.—Zarfl describes the postmortem in a case of Hirschsprung's disease (*Wien. klin. Rundschau,* No. 31, p. 488, 1913) occurring in a child of fifteen months. The colon was enormously distended, especially the transverse colon; in two places it was nipped—at the flexura lienalis and 10 cm. further toward the anus. The sigmoid between was dilated and contained a fecal stone the size of a goose egg. The rest of the distended gut contained nothing but gas. The intestinal wall was thickened, and toward the insertion of the mesentery there were inflammatory changes for two-thirds of the circumference. The mucous membrane was not altered at the side opposite to the insertion of the mesentery. Here intestinal contents could pass along, which explained why only small quantities of thin feces were evacuated. The muscular coating was notably thickened. The small intestine was normal, as was likewise the stomach. The case confirms the views of those who maintain that the pathological condition in Hirschsprung's disease, hypertrophy and dilatation of the large intestine, is not always congenital, but that it can arise when from any cause the lower bowel blocks the way for the passages of feces.—*The Universal Medical Record.*

CURRENT LITERATURE.

ABSTRACTS IN THIS NUMBER BY

DR. T. WOOD CLARKE. DR. HAROLD R. MIXSELL.
DR. CHARLES E. FARR. DR. WILLARD S. PARKER
DR. JEROME S. LEOPOLD. DR. MARK S. REUBEN.
DR. S. W. THURBER.

DISEASES OF THE EAR, NOSE AND THROAT.

SMITH, S. MACCUEN: EXHIBITION OF OTITIC BRAIN ABSCESS CASES AND A MASTOID EXENTERATION BY NATURE. (*Annals of Otology, Rhinology and Laryngology,* September, 1913, p. 769.)

The first case is that of an eight-year-old child which exhibited some of the symptoms which the author calls characteristic. One is the word aphasia in left-sided temporal lobe abscess and a certain facial expression that is difficult to describe; the severe pain in the frontal region of the affected side is considered pathognomonic; the eye and blood tests also are included and the following of the path of infection when possible either through the tegmen antri or the tegmen tympani in exploring.

This child was admitted to the Jefferson Hospital October 24, 1912, with the history of an aural discharge following scarlet fever three years previously. This discharge had been constant, with the exception of two periods of about three months each. Just prior to an exacerbation, the child would become irritable and confused. In the spring of 1912 the child became restless, quarrelsome and morose—she had been naturally cheerful—and one month before admission to the hospital she fell and struck her head in the frontal region. Following this blow, she had severe and persistent frontal headache, was extremely irritable, vomited and was able to retain but little food and had intermittent delirium. The left auditory canal was full of foul pus and an X-ray examination showed the mastoid cells full of pus. A radical mastoid operation was done on the 29th of October. The case followed the usual convalescence after a mastoid operation, but the irritability continued. She was allowed to return home, but on account of convulsions was brought back to the hospital, where she was kept under observation for two weeks, when she developed measles. For two weeks thereafter her condition was markedly improved, when suddenly the severe frontal headache returned and her mental state became worse. She had word aphasia, showed choked discs, some rigidity of muscles at nape of neck. The mastoid wound was reopened and an abscess found in the tempero-sphenoidal lobe containing about 3 ounces of greenish pus. Twelve days after this operation her mental condition was virtually normal and she is still under observation and doing well. S. W. THURBER.

STEWART, WILLIAM H.: RADIOGRAPHIC FINDINGS ILLUSTRATING THE ANATOMIC DEVELOPMENT OF THE MASTOID BONE. (*Annals of Otology, Rhinology and Laryngology,* September, 1913, p. 677.)

The belief that, under ten years of age, the mastoid cells were very small and rarely extended to the tip seems to be incorrect in the light of the findings of the author who demonstrates in his stereoscopic plates that—

(1) We frequently have distinct and well-formed pneumatic cells as early as two years.

(2) There is a wide variance in the character, location and extent of the mastoid cells under ten years.

(3) That given 6 children of any age, say five years, no two have mastoid cells alike.

(4) The mastoid cells may extend into the occipital bone, the squamous portion of the temporal and into the root of the zygoma.

(5) Cells of the same character vary in about 15 per cent. of the cases on the two sides.

(6) That with a fairly intelligent child the radiographs will show the character and location of the mastoid cells, their relation to the lateral sinus, external auditory canal and to the tegmen tympani.

It is an art to be able to take a good radiograph of a child and considerable training is necessary. The child has got to become accustomed to the noise of the coil and be free from fear of the whole performance. S. W. THURBER.

RICHARDS, GEORGE L.: CHOICE OF TREATMENT IN CHRONIC SUPPURATIVE OTITIS MEDIA. (*Annals of Otology, Rhinology and Laryngology,* September, 1913, p. 672.)

The author here discusses some conclusions with reference to the treatment of cases mentioned in the title.

First in children. Careful history taking is necessary to get at the facts in many cases, and it will generally be brought out that the ear began to discharge as the result of a cold of one of the exanthemata. If stated to be due to frequent colds, the condition of the nasopharynx should be looked into. Then correct any abnormal conditions, such as adenoid growths. Quite a number of cases will clear up after this operation. Those that do not will probably show some loss of drum membrane and adhesions in the middle ear. Such cases should be treated conservatively for a while by cleansing. Unfortunately this cleansing can only be well done by trained hands and thus becomes expensive. Relatively few of the whole number of discharging ears come to operation. If cleansing does not clear up the discharge some type of operation is indicated. If hearing is not much affected a too radical operation should not be attempted unless for very good indications. On the other hand, when the hearing is lost a radical operation is the best cure.

The question of how long to treat a child's ear before resorting to radical operations is a hard one to solve. When, after a lengthy conservative treatment, one suggests an operation as a cure, the question will be asked, "Why was it not done in the first place?" The principles of conservative treatment should be explained to the parents before undertaking the care of the case. The author thinks that nine-tenths of our cases, certainly in private practice, may be cured by the conservative methods.

S. W. Thurber.

INFANT FEEDING.

Talbot, Fritz B.: The Wet-Nurse Problem. (*Boston Medical and Surgical Journal,* November 20, 1913, p. 760.)

That there is a wet-nurse problem is shown by the fact that of 80 physicians who answered a circular letter only 8 did not use wet nurses at all. Most of those using wet nurses used an average of 6 or more and one used 25 a year. Breast milk is often necessary to save a baby's life, and in such instances must be obtained quickly. Some attempts to establish a central directory or agency have been unsuccessful because the directory required a woman to wait for a position, and as they are usually destitute this was impossible. A private agency in New York charges $25 for supplying a wet nurse and takes an unknown amount of the first month's wages. The babies are then put out to board and the writer is told that a large percentage of them die.

The essentials for a directory and home for wet nurses is as follows: The directory should be run in connection with a babies' hospital, where the problems of breast feeding are understood. There should be no charge for the board of the wet nurses, because they are nearly all destitute. The average length of time they wait for a position is fourteen days, and this they could not do if not given free board and lodging for themselves and babies.

In February, 1910, a directory for wet nurses was opened in Boston under the supervision of the Massachusetts Babies' Hospital. A moderate-sized house was obtained for a dwelling. The majority of the wet nurses were obtained through the various maternity hospitals in the city. This solves the question of disposal of many cases for the lying-in hospitals and gives suitable employment to many women to whom no other work is open. Wet nurses were also obtained through notification by postal of 8,000 physicians in New England with the request to send suitable women to the directory. On application to the directory a complete physical examination is made. The Wassermann test is done on the mother's blood and the vaginal secretion examined for gonococci. If free from disease the women are admitted to the directory. They are allowed to go only to a household in which the family practitioner guarantees that there is no danger to the health of the wet nurse or her baby. The baby accompanies the mother in every instance. This is beneficial to all concerned, first, because the breasts secrete more milk when stimulated by active sucking and the babies wet nursed are generally feeble; next, the mother is usually happier and hence more easily handled; lastly, the babies of the wet nurses are saved. During the stay at the directory the mothers receive instruction in the care of their babies; and, seeing mothers with sick babies, develop a sense of motherhood and responsibility. As 85 per cent. of the mothers are single this is quite important. They also regain their self-respect through honestly earning a living. After a position is ended in one family the wet nurse often goes to others.

The fee to the directory for supplying wet nurses has been raised to $20; the wet nurses receive $8 a week and board. A considerable income is derived from the sale of drawn breast milk at twenty-five cents an ounce. It is believed that the directory will shortly be self-supporting. WILLARD S. PARKER.

SAMELSON S.: INSUFFICIENT GAIN IN WEIGHT IN BREAST-FED INFANTS. (*Zeits. für Kinderhk.*, January 15, 1914, p. 19.)

Some young infants do not gain sufficiently on the breast. This may be due to hereditary lues, sepsis, or other infectious diseases, or to what is known as exudative diathesis. Underfeeding and overfeeding may also account for insufficient gain in weight in a young infant. There is another class of infants which do not gain sufficiently on breast milk. Physically these children appear normal in every respect. They receive sufficient breast milk, but no gain in weight results. This insufficient gain in weight is due, according to Samelson, to the infant's lack of ability to digest the fat in the breast milk. Giving water to these infants after the breast feeding often results in a satisfactory gain in weight. Similar observations have been made by Heubner. JEROME S. LEOPOLD.

SURGERY.

RICHTER, H. M.: CONGENITAL PYLORIC STENOSIS. (*Journal of American Medical Association,* January 31, 1914, p. 353.)

Nineteen of Richter's cases were of the hypertrophic type, with firm, olive-shaped muscle tumors at the pylorus, while 3 were of the spasmodic type. The tumor mass was palpated in 18 of the 19 cases and the diagnosis was positive in the 19th. At operation the mass was found to be one-half to three-quarters inch in length in each case, was freely movable and presented no evidences of inflammation. One case only came to necropsy. It presented the usual picture of simple hypertrophy of the muscle with sharply defined outline, and a redundancy of the mucosa. In all cases the stomach, unless previously emptied by the tube, was distended, while the duodenum was empty and collapsed. Fifteen of the babies were males. All cases were of the classical type as far as symptoms were concerned. X-ray cannot be relied upon implicitly, as bismuth will pass through the opening, although slowly of course.

The mortality was 13.6 per cent. In 19 cases a posterior gastroenterostomy was done with a mortality of 10.5 per cent.

In 2 a submucous pyloroplasty was done and in 1 a divulsion. Of the 3 deaths 1 was due to the child's condition, 1 to removing the sutures too soon, and 1 to too much operating, a gastroenterostomy following an unsuccessful pyloroplasty.

Of the 19 who survived the operation 1 died in less than a month of acute food intoxication, while 2 had to be reopened for obstruction due to adhesions and volvulus respectively. These 2 recovered and all the cases are now in good health, weighing as much as normal babies and showing no evidence of ill effect from the lesion or the operation. CHARLES E. FARR.

FROELICH, DR.: IS IT NECESSARY TO OPERATE IN SPINA BIFIDA? (*Medical Press and Circular,* November 5, 1913, p. 496.)

There is much difference of opinion as to the advisability of operating in spina bifida. In the author's experience the mortality among operated cases was 64 per cent.; among the cases treated expectantly, 29 per cent. He concludes: Operation should not be carried out, whatever may be the anatomical formation of the spina bifida, except in those cases in which operative procedure is necessitated by a rapid increase in the growth of the tumor, by imminent rupture, or by the appearance of patches of ulceration on the surface. In all other cases we should await developments while protecting the tumor with an appropriate apparatus. T. WOOD CLARKE.

BLACKBURN, T. L.: OPEN SAFETY-PIN IN ESOPHAGUS OF A BABY THREE MONTHS OLD. (*The Medical Journal of South Africa,* September, 1913, p. 46.)

The child was admitted to a hospital with a history of having swallowed a safety-pin. There were no symptoms and the baby appeared well and happy. X-ray showed the open safety-pin, point up, in the esophagus. "Masterly inactivity" was decided on in preference to immediate interference. A week later the child showed the first signs of discomfort. On the tenth day the child was anesthetized and placed on the X-ray couch, tube underneath and fluorescent screen above. A metal bougie was passed, and under slight pressure the pin was seen to dislodge and pass down into the stomach. Two days later, the pin being shown to be fixed at the pylorus, gastrotomy was performed and the pin removed. The child made an uneventful recovery.

T. WOOD CLARKE.

MEDICINE.

LUCAS, WILLIAM P., M.D., AND OSGOOD, ROBERT B., M.D., BOSTON: TRANSMISSION EXPERIMENTS WITH THE VIRUS OF POLIOMYELITIS.

The transmission of the virus of poliomyelitis is reported by the authors. Inoculations with filtrates from the patient's nasal secretions prove the fact that the microörganism is active four months after his second attack and two years and three months after his first attack. Typical lesions of poliomyelitis were found in the spinal cord of the injected monkey.

HAROLD R. MIXSELL, M.D.

CHANCELLOR, PHILIPP S.: THE PRIMARY LESION IN TUBERCULOSIS. (*Zeits. für Kinderhk.*, January 15, 1914, p. 12.)

Chancellor reports 3 very interesting cases of tuberculosis in infants in which the primary lesion could be definitely determined. All of the cases were infected by tuberculous individuals; 2 showed the point of entrance of the tubercle bacillus into the body on the cheek, while the third infant was infected through the tonsil. These cases show again how very important it is to keep tuberculous individuals away from children, and especially from children under one year of age. JEROME S. LEOPOLD.

SWIFT, GEORGE MONTAGUE, M.D.: CARDITIS. (*New York Medical Record*, February 21, 1914.)

The cause of heart disease and acute joint diseases in a series of 1,350 children admitted to St. Mary's Hospital for Children, was found to be due, in most cases, to acute infections occurring about the nasopharynx (adenoids, ethmoidal cells, tonsils), the gums, and alveolar processes irritated by decaying teeth. Removal of the source of infection and improving the condition of the nasopharynx and gums showed marked improvement in the child's condition. The temperature would subside, the joint signs tend to clear up, and, although a heart murmur would persist, other signs of cardiac disease disappeared.

Coombs (*Journal of Pathology and Bacteriology*, 1910-11, England) has reported investigations in regard to rheumatic nodules found in all parts of the heart's wall. He makes the point, which has especial interest to the author, that these nodules are peculiar to the rheumatic condition alone, and demonstrates the fact that the infection is carried via the coronary system of blood vessels.

Rosenow and Leila Jackson, September, 1911, demonstrated multiple embolic processes, generalized thoroughout the heart, by injecting guinea pigs and rabbits with infected human nasal secretions. The organism was found to be the streptococcus biridans and the nodules contained the infecting organism.

These facts were verified at St. Mary's Hospital for Children. In several cases streptococcus viridans was found in the blood of cases of acute cardiac disease; and in a case of staphylococcus infection of the finger there were found on autopsy staphylococci distributed throughout the myocardium and endocardium, thereby proving a generalized infection. Therefore, cardiac infections should be looked upon as similar to infections elsewhere, *i.e.*, as a septic process causing localized lesions. As all parts of the heart are involved together, though naturally in different degrees, we must consider the condition as a "carditis."

HAROLD R. MIXSELL, M.D.

MITCHELL, A. P.: INFECTION OF CHILDREN WITH BOVINE TUBERCLE BACILLUS. (*British Medical Journal,* January 17, 1914, p. 125.)

This is another of the very careful studies that have been made of late to determine the origin of tuberculosis in children. Mitchell chose the infected cervical nodes and investigated by guinea-pig and cultural methods 72 consecutive cases in children, 38 from Edinburgh and 34 from the surrounding country. Of these, 90 per cent. proved to be of the bovine type. He believes that the tonsils are the portal of entry in the great majority of cases. Of 90 cases examined, in which there was no evidence of involvement of the cervical nodes, the hypertrophied tonsils proved tuberculous histologically six times, and by guinea-pig inoculation nine. Bovine bacilli were found three times and human bacilli once.

CHARLES E. FARR.

SMITH, GEO. G.: THE EXCRETION OF FORMALIN IN THE URINE; AN INQUIRY INTO THE ACCURACY OF BURNHAM'S TEST. (*Boston Medical and Surgical Journal,* May 15, 1913, p. 713.)

From experimental evidence obtained from a large series of cases the author concludes:—

(1) Burnham's test for formaldehyde in urine is definitely

positive when this substance is present in the strength of one part in 40,000 or more.

(2) The urine should be examined as soon as possible after it has been voided. A negative test at one time does not prove that formaldehyde is never liberated.

(3) Formaldehyde is liberated from the hexamethylenamin by the acids of the urine, not by a specific function of the renal epithelium.

This process may take place in the kidney, but is continued in the bladder.

(5) Litmus paper, as an indicator of the true acidity of the urine, was unreliable in about 25 per cent. of the cases examined.

(6) The degree of acidity of the urine, as measured in terms of its hydrogenion concentration showed a constant relation to its power to set free formaldehyde. The higher the acidity, the greater was this power.

(7) The requisite amount of acidity, which is not great, is present in the majority of normal urines, and can be secured in almost all cases by the use of boric acid or sodium acid phosphate.

(8) The writer disagrees with the statements of Burnham and L' Esperance that only 50 to 60 per cent. of individuals break up urotropin. Examination of 213 specimens from 50 individuals showed that only in the urine of 1 case was formaldehyde never found. WILLARD S. PARKER.

LUCAS, W. P.: THE WASSERMANN REACTION IN ITS APPLICATION TO MEDICINE. (*Boston Medical and Surgical Journal*, July 24, 1913, p. 116.)

In pediatrics the Wassermann reaction is being much used in congenital syphilis, parasyphilitic conditions and in obscure cases. The mothers of luetic children almost invariably give a positive reaction. Of 30 mothers examined by the author 27 gave positive reactions; only 6 of these gave any history of specific lesions or had any evidence of lues at the time the reactions were obtained.

The performance of the test on wet nurses is especially important now that their use is being so widely acknowledged in difficult feeding cases or in cases in which breast feeding is desired during the first months of life.

Churchill's analysis of 100 hospital cases tends to show that there is a large amount of congenital syphilis among hospital patients. There was a comparatively large number (37 per cent.) of positive reactions in cases having no clinical signs, emphasizing the importance of the test in unearthing obscure cases.

The fact that syphilis attacks with great severity the heart and blood vessels of the fetus has only lately been fully appreciated. Obliterative endarteritis of small cerebral vessels, an acute gummatous endarteritis of some of the large arteries of the brain as well as of the aorta, are not infrequently found. Fibrous myocarditis and gumma of the heart wall occur.

WILLARD S. PARKER.

HISTORICAL.

JACOBI, ABRAHAM: PEDIATRICS IN THE UNITED STATES. (DIE KINDERHEILKUNDE IN DEN VEREINIGTEN STAATEN.) (*Archiv. für Kinderhk.* (*Festschrift,* Dr. A. Baginsky), 1913, pp. 413-426.)

In a brief but very interesting article Dr. Jacobi has sketched the origin and progress of pediatrics in the United States. In 1660 a woman was burnt at the stake for giving birth to an anencephalus. In 1646 Packard reported the first case of hereditary lues. Winthrop states that they rooted out this contagion "through the good foresight of God." The first medical publication appeared in 1677, edited by Thomas Thacher. The first cases of measles were reported from New England in 1713; scarlet fever broke out in Philadelphia in 1783; first authentic report of diphtheria was made in 1659. The clinical descriptions of this disease, by William Douglas (1736) and Samuel Bard (1781) are classics. In 1806 the first autopsy on a child was performed by James Stuart; in 1825 appeared the first complete book on pediatrics, by George Logan. The name of J. Lewis Smith is intimately connected with the history of pediatrics. His book on this subject had a far-reaching influence. In 1896 O'Dwyer first reported his success with intubation in diphtheria. In 1857 Jacobi began to give summer courses at College of P. and S.; in 1860 he was made professor of pediatrics at the New York Medical College; this was the first college to have a separate pediatric department. The first full professor of pediatrics was Thomas M. Rotch, of Harvard. At present there are 70 professors of pediatrics in as many medical institutions in the

United States. The first writings of Jacobi appeared in 1857; in 1895 appeared the first edition of Rotch's book, and in 1896 appeared the notable work of Holt, "which in the course of a year had become much liked and widespread and recognized as a classic."

In May, 1868, appeared the first number of the *American Journal of Obstetrics and Diseases of Women and Children,* under the editorship of Dawson, Noeggerath and Jacobi. In 1884 Watson originated the ARCHIVES OF PEDIATRICS. The first number of *Pediatrics* appeared in 1895. In 1911 appeared the first number of *American Journal of Diseases of Children.*

Holt investigated the children's hospitals in 50 cities of over 100,000 population in the United States; 34 cities have hospitals for contagious diseases; 24 of these have been in existence only since 1900; there are only 22 children's hospitals exclusive of those which are used for contagious diseases; only New York (8), Philadelphia (5), Chicago (2), Boston (2) and Buffalo (2) have more than one.

In 1860 an attempt to create a pediatric department at the New York Academy of Medicine met with failure. In 1880 the American Medical Association created a section for pediatrics. In 1885 the New York Academy of Medicine developed a separate section for pediatrics. The American Pediatric Society was originated in 1889.

MARK S. REUBEN.

BOOK REVIEW.

THE INTERNATIONAL MEDICAL ANNUAL. A YEAR-BOOK OF TREATMENT AND PRACTITIONERS' INDEX. Thirty-seven contributors. Thirty-second year. Octavo, 732 pages, illustrated by plain and colored plates. Price, $3.50. New York: E. B. Treat & Co., 241-243 West Twenty-third Street. 1914.

Every year this work comes to the reviewer's desk and each year its advent is welcomed with enthusiasm. We know of no other work which embraces in so few pages so much that is essential to the knowledge of every medical man. On our shelves a series of the volumes extending back ten years is one of the most frequently consulted of all medical works, serving the purpose of ready reference to medical advances and medical literature of the last decade. The volumes as they have appeared seem to us to have exceeded each its predecessor in the carefullness of the editing and the completeness of the survey. Better illustrations are hard to find.

We recommend the *Annual* as a work for several reasons. In the first place it serves as an index of new drugs and remedies, and gives information as to the value of these new remedies and of old ones about which data have been collected, in a way that no text-book of materia medica can possibly do. To follow through the pages of successive *Annuals* the use of salvarsan, for instance, is to acquire a knowledge of specific antisyphilitic medication that is complete and authoritative, while the latest synthetic hypnotic is described even before the enterprising agents of the drug have had time to circularize one. Such therapeutic subjects as Radiotherapy, Roentgenology, Ionic Medication, etc., have in the present volume, and have had previously, complete and accurate discussions, even amounting to monographs. So much for the therapeutic side. In the second place, clinical and experimental advances in both medicine and surgery are carefully covered and the resulting condensation is *readable*. Special articles are continually being introduced. In the present volume stress is laid on Anesthetics, Blood Examination, Brain Surgery, Bronchoscopy, Cancer, Fractures, Surgery of the Lung, Pellagra, Artificial Pneumothorax, Lateral Spinal Curvature, Syphilis, Tuberculosis and Public Health. Much of the material is not available to practitioners who live remote from a large medical library, and even by those in large cities cannot be obtained without great labor and much expenditure of time. In the third place, as an "Index Medicus" a series of these volumes is excellent. The writer had occasion some time since to wish to collate the literature on poliomyelitis and obtained a very complete bibliography in this manner. As a starting point for looking into the literature of any medical subject the *Annual* cannot be bettered.

Serving as it does these three functions admirably, the *Annual* cannot help but be a volume of value to every physician, particularly to him whose remoteness from large libraries makes it difficult, if not impossible, to know what is going on.

We congratulate the editors of the *Annual* and hope that many more volumes may appear.

ARCHIVES OF PEDIATRICS

MAY, 1914

ROYAL STORRS HAYNES, PH.B., M.D.,
EDITOR.

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EDITORIALS

THE CHILDREN'S DEPARTMENT OF THE MASSACHUSETTS GENERAL HOSPITAL.

When, last November, the visitors to the Boston joint meeting of the New York, Philadelphia and New England pediatric organizations were whisked from the Copley Plaza to the Massachusetts General Hospital to see the Children's Department under the guiding care of Dr. Talbot and Dr. Smith, a very illuminating treat was in store for them.

So interesting was the work there displayed that the ARCHIVES asked Dr. Smith to write up the work they are doing for this number and Dr. Smith's account is presented herewith. But neither Dr. Smith's paper nor the illustrations which accompany it can give quite the picture that one gets who actually sees the Children's Department in operation.

Perhaps it is just Boston, perhaps the modern Athens in itself lends a pervading glamor of cultivated perfection to all its institutions—whatever it may be, it was borne in upon one, at least, of those visitors, that, compared to the out-patient work which he knew or knew of, this at the Massachusetts General excelled in *spirit*. From the entrance into a spacious waiting room downstairs, where a pleasant official separated one class of patients from another, up the stairs, of easy gradient, to the floor devoted to children, everything was friendly despatch without turmoil. The children's rooms, themselves, while not large, are admirably arranged and, with the systematization of the work, utilized to capacity. Of this there is more and to better purpose in Dr. Smith's article.

Three things, however, emerge from the many which seem fundamental to true success in dispensary work and which are markedly in evidence there in Boston.

The first is a proper systematization of the work so that the patients are seen as soon as possible, adequately examined, even to laboratory methods, and carefully treated by *interested physicians*. Nowhere can it more truly be said of work, "I don't do it because I like it; I like it because I do it," than of work in an out-patient department. Men get from such a service what they put into it, and the more faithful their work the greater reward of increased knowledge accrues. However, it is sometimes hard to have this appreciated, and it is greatly to the credit of those directing this dispensary that the work is made likeable by dividing up the cases into classes and assigning certain classes of cases to one man and another to another, with the expectation that some investigation shall be undertaken by each man. This means that scientific work must be done and not a mere running over of patients. And this sort of work must be the real lodestone to attract men to any out-patient department. Rewards in place and position from such work are few or none; reward in mental satisfaction and in medical experience are all that can be expected. If the machinery, the patients and the spirit are faulty, then there are other more congenial places in which to while away the idle hours of beginning practice.

In our work with private patients we are glad for each detail of their environment and feel we have them better in hand when we have seen them at home and know how they live. It is likewise with dispensary patients and one of the causes of the lack of satisfaction so often experienced in this kind of medical work. Granted that we have the time and the means to examine thoroughly and diagnose correctly the illnesses that pass before us, when we come to treatment, we do but break the ground for our edifice when we only prescribe. Less and less do we use drugs; the "therapeutic nihilists" grow in numbers with the years; to give a *placebo* is a confession of weakness, and yet in dispensary work, nine times out of ten, to prescribe is all we do. And that is all we are likely to do unaided.

Here is the second point of excellence at the Massachusetts General. The social worker's desk is cheek by jowl with that of the physician. She supplements his work and through her eyes and her ministering hands he sees and cares for (cures) his patients completely. It is not subordinate work that the social worker does, it is quite coördinate. But it does not require four arduous years of medical study, and it does require a personal sympathy which much dwelling on pathology will hardly supply. We are inclined to think the excellence which was so noticeable to us was not due so much to the influence of the Hub itself as to that of social service everywhere binding together patient and physician, home and dispensary, environmental and medical therapeutics.

A physician does not gain great medical experience in children by doing office practice only. He must know also about children sick enough to be in bed. A successful dispensary must have as a Siamese twin, a hospital ward. This is the third point. At the Massachusetts General the association is very close. The in-patient attending is the out-patient director; the house officer is active in both branches of the service. The assistant physicians are welcome in the wards. They follow their sick children; they gain their sick-bed experience.

There are other points of excellence about this children's department. The idea of having frequent surveys is excellent. It is the recapitulation which every business house deems essential. The follow-up system—an adaptation of the one introduced by Mr. Davis at the Boston Dispensary* and observed with much interest by the same visiting physicians last November—makes for a closer bond between patient and doctor and greater thoroughness of treatment. The clinic manager ties up all the loose ends and keeps the physicians from loafing.

But the lasting impression of the Massachusetts General Children's Department is of the *spirit of the place*—a spirit of friendliness, a spirit of service, a spirit of conscientious medical work.

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* See page 399.

STANDARDS FOR PEDIATRIC CLINICS.

Lest we be accused of taking the position that no good can come out of our own Nazareth, and of neglecting to honor our own New York prophets, we hasten to mention the work of the Associated Out-Patient Clinics, particularly its Pediatric Section.

By the latter, a code of standards has been worked out and a classification made of pediatric clinics into Class A, Class B, and all others, with the recommendation that unless a clinic qualify at least for Class B it were better closed.

The Standards for Class "A" are as follows:—

1. Efficient medical treatment at all seasons of the year, which can only be possible
    - (*a*) if no more than 6 patients, old and new, per man per hour, are admitted, and
    - (*b*) if arrangements are made for the presence of a medical director or his first assistant during every clinic hour throughout the entire year.
2. A nurse in attendance during all clinic hours, and a visiting nurse exclusively attached to the clinic. When practical and possible the same nurse should combine the two functions.
3. At least two examining rooms and an additional room for teaching where teaching is done at the clinic.
4. An isolation room for contagious disease cases.
5. A paid assistant present during all clinic hours, one of whose duties should be the segregation and isolation of contagious cases.
6. Proper laboratory facilities for the immediate examination of specimens of blood and urine at the clinic or at least in the dispensary or hospital building.
7. Proper equipment should consist of—
    - (*a*) Proper examining table.
    - (*b*) Proper scales for infants and children weighing up to 100 pounds.
    - (*c*) Measuring instruments, such as callipers, rulers, etc.
    - (*d*) Proper light for nose, ear, throat and head work.
    - (*e*) Proper and plentiful supply of linen, towels and sheets, etc.
    - (*f*) Proper desk and chairs.
    - (*g*) Proper ventilation, plumbing and light.
    - (*h*) Proper surgical instruments.

(*i*) Walls and floors easily washed.
(*j*) Filing cabinets for history cards.
(*k*) "Reference Blanks" for patients referred to other departments of the institution or to other institutions.
(*l*) Facilities for X-ray work.
(*m*) Printed diet lists and printed hygienic instructions for children over a year.

8. Special provisions for treating whooping-cough cases (either a special room or special time) until such time as the Department of Health provides adequate facilities for the treatment of this class of patients.

9. An infant milk station at the clinic or close coöperation with a Department of Health milk station, arranged in such a way as to be mutually agreeable to the clinic and the Department of Health.

10. Special provision for vaginitis cases, if they are not taken care of in some other department of the institution.

The Standards for Class "B" are as follows:—

1. Efficient medical treatment at all seasons of the year, which can only be possible
   (*a*) if no more than 6 patients, old and new, per man per hour, are admitted, and
   (*b*) if arrangements are made for the presence of a medical director or his first assistant during every clinic hour throughout the entire year.

2. At least two examining rooms and an additional room for teaching where teaching is done at the clinic.

3. An isolation room for contagious disease cases.

4. Proper laboratory facilities for the immediate examination of specimens of blood and urine at the clinic or at least in the dispensary or hospital building.

5. Proper equipment should consist of—
   (*a*) Proper examining table.
   (*b*) Proper scales for infants and children weighing up to 100 pounds.
   (*c*) Measuring instruments, such as callipers, rulers, etc.
   (*d*) Proper light for nose, ear, throat and head work.
   (*e*) Proper and plentiful supply of linen, towels and sheets, etc.
   (*f*) Proper desk and chairs.

(*g*) Proper ventilation, plumbing and light.
(*h*) Proper surgical instruments.
(*i*) Walls and floors easily washed.
(*j*) Filing cabinets for history cards.
(*k*) "Reference Blanks" for patients referred to other departments of the institution or to other institutions.
(*l*) Printed diet lists and printed hygienic instructions for children over a year.

6. Special provisions for treating whooping-cough cases (either a special room or special time) until such time as the Department of Health provides adequate facilities for the treatment of this class of patients.

7. Special provision for vaginitis cases, if they are not taken care of in some other department of the institution.

It is the opinion of the Executive Committee that all children's clinics falling below Class "B" should be made to conform to the minimum requirements of Class "B" or be discontinued.

The adoption of these standards is a step in advance. They may not infuse much spirit into a clinic, but they will furnish an ideal upon which to build one and will serve to point out to the laggard wherein he falls behind.

AN INCIDENT IN THE DISPENSARY PROBLEM.*

Here is an incident that shows in a striking way one of the Association's problems:

The several waiting rooms of one of the largest, best equipped and most generously maintained hospitals in the city were crowded one morning with the usual number of suffering humanity. The long, hard, wooden benches were closely packed with people silently waiting "their turn" to enter the glass door at one end of the room and to have such treatment as the doctor had the opportunity of giving them.

In one of the rooms just off the left of the main hall, on an uncomfortable wooden bench, sat a man holding in his lap a helpless little boy. For a great many mornings this man had sat patiently waiting "his turn" to enter the glass door, only to be told, when the time for the public clinic was nearing its close, that the doctor who treated such cases as this of his boy's would not be around that day and to come again, or perhaps he would be told that if he came at three o'clock in the afternoon he would stand a better chance of seeing the physician. Three o'clock in the afternoon would mean the loss of an entire day at the factory, for every hour of which he was "docked."

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* Reprinted from the Report of the Babies' Welfare Association for the week ending Saturday noon, May 2, 1914.

The man would rise heavily and wearily from his hard bench and, carrying the boy very tenderly in his arms, make his way out through the long halls, down the great stone steps and turn his face toward the east to walk many blocks before he reached his home, which was merely a place of shelter, hardly a home for human kind to live in.

The next day he would work at the factory until noon, go to his home and carry the baby again to the clinic at three o'clock, to be met with the same situation. The doctor had telephoned he would not make that hospital that particular day, but he could be found at another clinic, some twenty blocks away. The man would again lift his burden and seek the other hospital. When he arrived it was to find that there were a great many people waiting before "his turn" would come, and again the hour for receiving patients would be over before he had his chance to see the doctor and obtain the much-needed medical attention.

The man's little son had infantile paralysis. He had been bound hand and foot, a hopeless, helpless cripple, unable to move or to walk and many times even to speak. If the boy could have had the proper medical treatment he would have been able to have grown stronger and help fight the trouble. The man knew it was impossible for him to try and buy a brace for his boy, as he eked out just enough of a livelihood to maintain in a very meager way his wife and three little children. As this family could not afford the services of a private physician, they had been told that in New York City there were at the various hospitals clinics where it would be possible for this child to have the proper treatment.

Gradually the boy grew weaker and, finally, one night during the Christmas holidays, from neglect that it was impossible for the family to remedy, he died, after months of intense suffering.

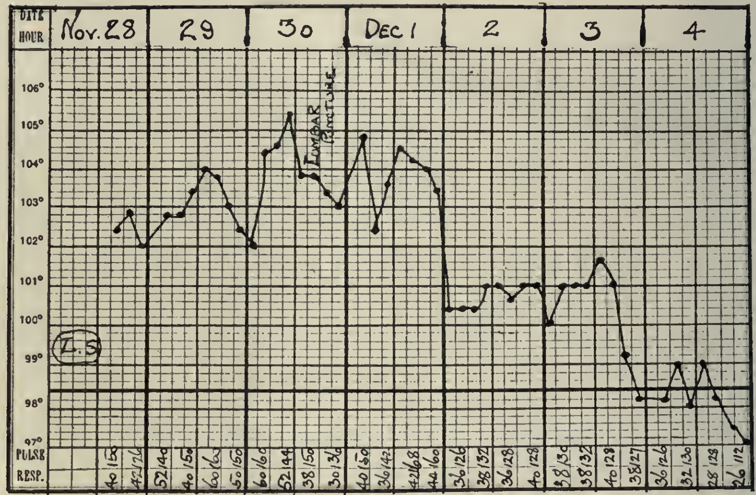
And yet we have in this city of ours seventy-six clinics (and dispensaries) which make it their especial practice to look after and care for such cases. Is it simply that there are not enough public clinics, enough doctors willing to help care for the people who come to them? Or is there something wrong with the system?

ORIGINAL COMMUNICATIONS

PNEUMOCOCCIC MENINGITIS AND MENINGISMUS.*

BY FRANCIS HUBER, M.D.,
Professor of Clinical Medicine, Columbia University, New York.

It may be remarked, in passing, that a much larger number of pneumonia cases than the 4 reported below† presented cerebral disturbances. Such instances only, in which the nervous manifestations were sufficiently pronounced to warrant lumbar puncture and in which the spinal fluid did not contain bacteria, have been selected as the topic for the paper.



Temperature Chart of Case I.

Case I. Lena S., aged fourteen months, admitted November 28, 1910. Family history negative, previous health good, breast fed. The present illness began suddenly four days ago with convulsions, high fever, prostration, cough and some dyspnea. The patient has had several convulsions since onset. Temperature was somewhat lower today. Since yesterday the child has been very quiet and somewhat apathetic, has vomited a few times, sleeps with eyes partly open, dull look noted, lateral nystagmus present, a slight degree of strabismus exists, pupils react slowly; though no muscular twitchings have been observed, grinding of teeth has been noticed during the past two days. When admitted the general condition was fair, slight dyspnea present, patient markedly apathetic with restlessness more pronounced at times. Occasional slight rigidity and twitchings in the extremities. Tache present. On physical examination a few moist râles with slight dullness were found posteriorly over the right apex.

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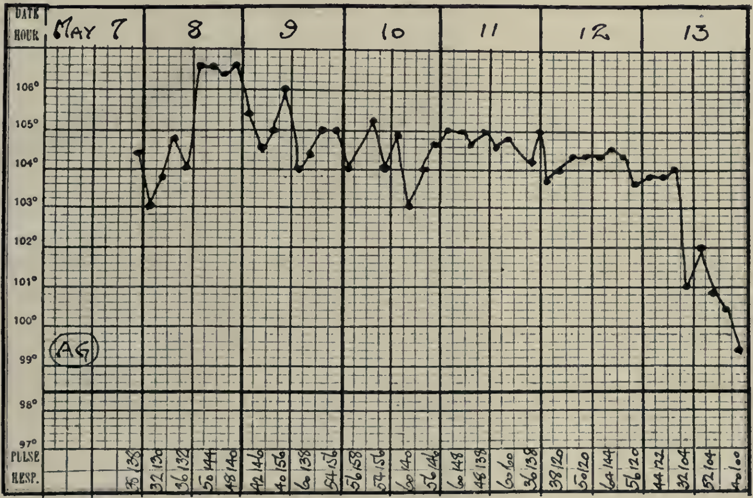
* Read by title at the meeting of the American Pediatric Society, May, 1913, and read by invitation at meeting of the Bellevue Hospital Alumni Association, June 5, 1913.

† From the Children's Service, Beth Israel Hospital.



Temperature Chart of Case II.

On the day of admission a lumbar puncture was done and 12 c.c. of fluid slightly tinged with blood was obtained, under pressure. The urine showed a heavy trace of albumin, with a few granular casts and a moderate number of pus cells.

Two days later a second puncture was made; 10 c.c. of clear fluid under considerable pressure were allowed to escape. December 1st. Drowsiness and stupor still present, upper and lower extremities are moderately rigid, varying, however, at different times. December 2d (eighth day of the disease), the physical signs of a lobar pneumonia are now well marked at the right apex posteriorly. General prostration less. Von Pirquet negative. A week later the pulmonary signs have all disappeared and the mental condition is decidedly better.

Blood: White blood corpuscles on admission, 32,000; polymorphonuclears, 91 per cent. Three counts on three successive days showed white blood corpuscles 36,000 to 32,000, with polymorphonuclear of 88 to 76 per cent.

Examination of the cerebrospinal fluid shows a trace of albumin and sugar present. Bacteria negative. Cytology, occasional polynuclear and lymphocyte.

Case II. Abraham G., eleven years old, was brought in, on the ambulance, after a four days' illness, during which time he suffered severely from headache, fever, nausea and projectile vomiting. Slight cough reported, with dyspnea and marked prostration. As he grew progressively worse, the fever ranging from 105° to 107°, he was sent to the hospital.

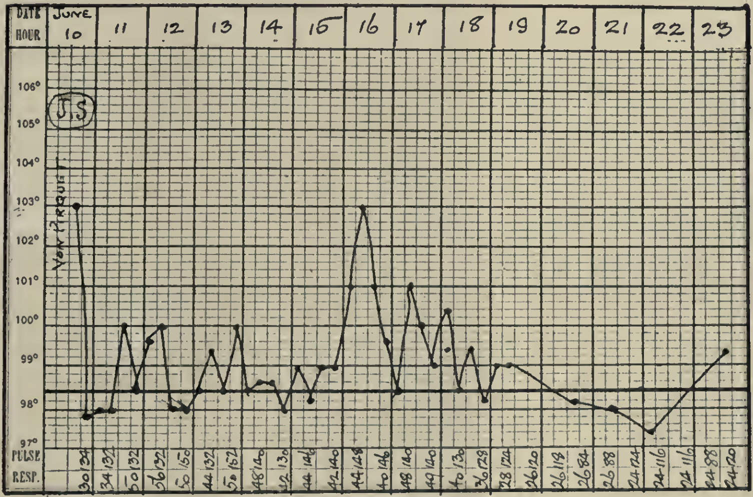
May 7th. On admission, the boy was fairly well developed and nourished, though in a comatose condition and markedly prostrated; dyspnea was pronounced, with moderate cyanosis. The left pupil was larger than the right, internal strabismus of left eye. Both pupils responded slowly. Neck rigid, Kernig present. Examination of chest revealed a distinct pneumonia of right upper lobe. Blood examination, 26,000 white blood corpuscles, with 90 per cent. polynuclears. Urine showed a trace of albumin, few hyalin and finely granulated casts.

For a number of days urination and defecation were involuntary. Great difficulty was experienced in giving nourishment and fluids. Proctoclysis resorted to. Blood culture negative on the ninth day of the disease. About the twelfth day the crisis occurred, though the coma, Kernig sign and rigidity were still marked.

White blood corpuscles now 14,000, with 90 per cent. polynuclears. General symptoms somewhat improved, takes nourishment nicely. Lumbar puncture done on the thirteenth day of illness and 5 c.c. of clear fluid under pressure were removed, without any evident improvement. On the contrary, he became more restless during the following three days, tossing about a good deal.

The cerebrospinal fluid was negative for organisms; a slight amount of albumin was present; reduction for sugar positive.

On the eighteenth day, stupor less marked, patient less restless. The following day, though still somewhat irrational, he began to appreciate his surroundings, wanted to know what he had done and why he was compelled to sleep in the street (he had been kept out in the open air on the roof). Shortly after this he gradually began to regain control over his sphincters, urine negative. About the twenty-first day mind is clearer, pulmonary signs have cleared up. From this time on there was a steady improvement in his mental and physical condition and at the end of the fourth week he appeared to be well in every respect.



Temperature Chart of Case III.

CASE III. Jennie S., three years of age, admitted June 10, 1912. The patient was taken suddenly ill sixteen days ago with fever, vomiting and convulsions. Shortly after, cough, dyspnea, some diarrhea and prostration were evident. The temperature continued high during this period. For the past week the vomiting has ceased, well-marked twitchings of the extremities were observed, and for a few days the left arm appeared to be paralyzed, though at the present she uses the arm fairly well. Restlessness has been a prominent symptom throughout the illness. The patient has been quite drowsy for some little time past. On admission the girl was poorly developed, and in semi-coma tosses head about when disturbed and is very irritable and restless. The left pupil is smaller than the right, both react slowly, strabismus of left eye. Moderate rigidity of neck. The right lung is the seat of an extensive pneumonia. Lower extremities are rigid, Kernig not pronounced.

June 10th. Lumbar puncture, 5 c.c. clear fluid, under moderate tension, removed.

June 16th. Second lumbar puncture performed and 4 c.c. of clear fluid, under some pressure, were taken away.

The improvement during the past week has been gradual. The child is not so restless, takes nourishment better and is brighter mentally, but does not talk. Pulmonary signs have cleared.

Red blood corpuscles, 2,120,000; hemoglobin, 50 per cent.; white blood corpuscles, 11,200; polynuclears, 83 per cent.

Urine—three examinations—negative. Nose and throat cultures negative. Blood culture also negative. Cerebrospinal fluid, smear and culture negative. Cytology negative. Albumin present. Reduction to sugar positive.

After February 17th the subsequent convalescence was uneventful. The patient's temperature on admission at 6 P.M. was 103°; dropped to $97^8/_{10}$° at 9 P.M. During the rest of the week it varied between 100° and 98°, the apex becoming lower and lower until the 16th, when it reached 103° at 3 P.M.; at 9 P.M., $99^6/_{10}$°.

Subsequent progress uneventful.

CASE IV. Abie G., two years of age, admitted February 26, 1913. Sixteen days before, after having been ill for several days previously with a cold in his head, he was taken suddenly with high fever, flushed face, restlessness followed by cough, dyspnea and great prostration. Bowels constipated. No chills, convulsions or twitchings reported. The temperature subsided ten to twelve days later, the cough diminished and the child was apparently well.

The following day the fever returned, the child became restless, drowsy and apathetic. Had twitchings of face and began to roll the head from side to side. The cough, though persisting, was less frequent. The patient is well developed and nourished. The head is large, particularly in the frontal region; face small. Pupils somewhat dilated, left more so than the right; some strabismus present. Both pupils react slowly to light and accommodation. Neck markedly rigid to flexion and extension. There is dullness over both lower lobes posteriorly, more so on left side, where the pneumonia process is more recent.

Distinct automatic movements of both upper extremities are present, as are twitchings of the eyelids and mouth. Nose and throat culture negative. Pus from a small abscess (due to a hypodermic injection) over the ninth rib on the left side in the postaxillary line shows staphylococcus aureus infection.

In view of the low grade of meningitis presented by our patient, an "X-ray" of chest was taken in order to eliminate a possible tuberculous condition. The plate revealed several areas of atelectasis near the right root and in the right lower lobe and a consolidation on the left side corresponding to the recent pneumonic area; no evidence of any tuberculous deposit could be detected. Urine negative. Blood count: Red blood corpuscles, 3,548,000; hemoglobin, 80 per cent.; white blood corpuscles, 16,000; polynuclears, 88—70 per cent.

February 26, 1913. Lumbar puncture performed and 5 c.c. of fluid removed—clear, colorless and under normal tension. Bacteriology negative.

February 28th. Though still apathetic and restless the rigidity is less but the automatic movements persist.

March 2d. Apathy less. March 4th. Pulse still irregular, patient brighter. By the 7th the cerebral symptoms have nearly all disappeared. March 13th. General condition improved, quite bright, though irritability persists. Subsequent course uneventful. Recovery complete.

The 4 cases just briefly detailed present a number of special features in common. The well-marked cerebral symptoms with coma, the cerebrospinal fluid being free from bacteria, are striking and open up some interesting questions.

As there appears to be a decided difference of opinion among various authorities as to the correct interpretation of the underlying pathological condition, whether functional or otherwise, a consideration of this particular type may be of interest to us as clinicians.

Symptoms of meningeal involvement during the course of pneumonia are always a source of anxiety. Is the trouble functional, due to high temperature, toxemia or an unstable nervous system? Are we dealing with a complication of meningismus or serous meningitis (so-called), or is there a pneumococcus meningitis present?

The introduction of lumbar puncture as an aid in differentiation enables us to arrive at an exact diagnosis as to the variety of meningitis in many cases in which formerly only a probable conclusion was possible.

Though the diagnosis of the special type has been greatly facilitated by lumbar puncture, are we justified in excluding the existence of a meningitis or meningoencephalitis simply because the spinal fluid is negative on lumbar puncture?

A study of the more recent literature reveals the report of cases in which the cerebrospinal fluid may or may not have been excessive in amount and no organisms were detected after a careful bacteriological examination. At the autopsy, however, a pneumococcic meningitis or meningoencephalitis was discovered.

Clinical studies and pathological findings have shown serious involvement of the brain and meninges without revealing any abnormal condition of the cerebrospinal liquor, except perhaps an increase in amount. Positive findings only are conclusive in this regard.

Blatteis and Lederer (*Journal of American Medical Association,* March 15, 1913) have analyzed 426 cerebrospinal fluids due to various pathologic conditions. In 25 cases of pneumonia presenting meningeal symptoms but 4 gave evidence of a true pneumonic meningeal inflammation.

To quote from their paper: "Although the difference between the symptoms of meningeal irritation (so-called meningismus) and true pneumonic meningitis are those of degree only, the marked differential characteristics of the spinal fluids determines the conditions. When the cerebrospinal symptoms were due only to irritation, the fluids were found to be normal in every way. Here lumbar puncture relieved the symptoms of the patient affected as well as the mind of the attending physician, for as long as the chemical and cytologic findings were a low albumin content, a reduction of Fehling's solution and a negative globulin reaction with a sparse cytology of two or three lymphocytes per microscopic field, meningitis without a question of doubt could be ruled out.'"

Phebe L. Dubois (*Journal of American Medical Association,* March 15, 1913), in discussing the differential diagnosis and treatment of cerebrospinal meningitis, presents an analysis of

247 cases (studied in the Research Laboratory of New York Health Department), at least half of which were reported as epidemic cerebrospinal meningitis and the rest either as meningitis, kind not designated, or as tuberculous meningitis. Of this number the final diagnosis in 48 cases was meningococcus infection, 75 tubercular, 37 infantile paralysis and 3 pneumococcus meningitis. In 19 cases of pneumonia, rigidity of the neck and Kernig's sign were present, leading to the belief that meningitis probably existed. The same author further states: "The meningismus coming early, before there are any signs of pneumonia, is the most difficult of all these conditions to distinguish from true meningitis; often by the time we reach the case the real diagnosis is apparent."

Exact figures as to the frequency and relationship between pneumonia and meningoencephalitis can be attained only by the systematic and complete study of all the cases of pneumonia. Lumbar puncture alone is not conclusive, as will be seen later on.

Kurt Blühdorn (*Berlin. Klin. Woch.*, 1912, Vol. XLIX., p. 1,796) studied a series of 11 cases of serous meningitis. The term is employed by him to designate the external form of the disease, in which there is an increase of fluid in the subarachnoid space, due to an inflammation of toxic origin. The process may be due to the typhoid bacillus, the pneumococcus, the bacillus of influenza, the meningococcus, and more particularly it may follow a streptococcic infection originating in the ear.

Such a serous meningitis may be merely the forerunner of a purulent meningitis and may cause death without apparent pathologic change in the tissues. On the other hand, pure cases do occur in which the fluid remains clear and complete recovery takes place. In some cases it is believed that the substances elaborated by the bacteria, through chemical action on the brain cells and surrounding tissues, excite the plexus to hypersecretion.

Similar meningeal conditions occur in various infectious diseases in which the most careful bacteriological test, cultured and animal, fail to reveal any organisms. It is assumed therefore that this specific factor of the primary disease or its toxin is the etiological factor of the meningitis.

The cases studied by him presented the general symptoms and course of a meningitis with an increased quantity of clear spinal fluid under pressure. There was an absence or a slight trace of albumin, very few formed elements and no bacteria, though looked for under the most careful tests.

Three cases were associated with pneumonia. One of these ultimately developed pus in the spinal fluid with pneumococci. The other two he believes were undoubtedly actuated by the bacterial toxins and remained clear types of serous meningitis. Two cases developed during pertussis. Five cases are discussed in which the fluid was sterile, although under high pressure, no primary disease being present to explain the meningitis.

Lumbar puncture exerted a beneficial effect on the acute process, although several subsequently showed mental impairment.

Jules M. Brady (*Journal of American Medical Association*, March 29, 1913) reported the following case of pneumococcus meningitis with normal cerebrospinal fluid. The infant, male, one year old, had been ill about a month, suffering from bronchopneumonia with exudative pleurisy. Owing to the character of the fluid removed by lumbar puncture, and the frequency of the symptoms-complex (meningismus) in infectious processes the diagnosis of meningitis was not made. At the autopsy no marked increase in cerebrospinal fluid was observed, nor were the ventricles distended. The convexity and the parietal surface of the frontal extending backward to the parietal lobe, was covered by a thick fibropurulent exudate in which pneumococci were found. Base not involved.

The conclusions arrived at by the author from the study of the case lead him to the following:—

(1) The positive diagnosis of pneumococcus meningitis may be impossible during life.

(2) A normal cerebrospinal fluid may be obtained throughout the disease.

(3) Anatomic changes (encephalitis, meningitis) occur oftener than usually believed and are the explanation of symptoms from the side of the nervous system which we have regarded in the past as functional (meningismus).

Holt (*American Journal of Diseases of Children*, January, 1911), in a carefully prepared and instructive article, has studied 300 cases of acute meningitis, etc., 197 of which were observed during the lumbar puncture period; 22 of this number were due to the pneumococcus. In 20 out of the 22 cases the organism was found in the cerebrospinal fluid. Particularly interesting are the 2 cases in which the spinal fluid was negative. While in only one of these was the diagnosis established by an autopsy, the symptoms in the second case were so similar that the diagnosis seems reasonably clear, though not positively proven.

The first was a child twenty months old whose attack was ushered in with repeated convulsions, fever and a leukocytosis of 24,000. For one week the symptoms were those of a fairly typical acute cerebrospinal meningitis, except for the absence of rigidity of the neck and extremities. Puncture made on the first day and repeated on the seventh day gave a perfectly clear fluid. No organisms of any kind could be discovered in the smears or by culture. During the third week the patient developed pneumonia with consolidation; and the persistence of the nervous symptoms led to a third puncture which, like the other two, gave negative results, although the amount of fluid removed was large—105 c.c. After six weeks all the acute symptoms subsided and the condition resembled one of a mentally defective child, with slow wasting. Death occurred in the eleventh week from a second attack of pneumonia. The autopsy showed an old meningitis at the convexity; from this exudate a pure growth of the pneumococcus was obtained. The base of the brain was normal.

The second case, occurring in a child fifteen months old, was almost the counterpart of this first one, but ended in partial recovery. Three punctures were made, in all of which the fluid was negative. Pneumonia developed in the fourth week, but cleared up. Active nervous symptoms continued for four weeks longer, then gradually passed away. When discharged from the hospital the patient could not sit up nor support the head. Vision and hearing seemed absent. Six months later the patient was seen again. There had been considerable improvement, but the child clearly was mentally defective.

It seems evident that there was in both of these cases some involvement of the cortex in the inflammatory process, but no paralysis occurred in either case. Neither in its symptoms nor in its course did the disease suggest the cerebral form of poliomyelitis. We are accustomed to place so much reliance on lumbar puncture that the possibility of the existence of acute meningitis with a normal fluid is rather difficult to grasp.

Holt further refers to the difficulty of diagnosis, for anatomic reasons, in some cases. The lesion is most frequently met with at the convexity.

In this situation the characteristic symptoms, as opisthotonos, irregularity of pulse and respiration, cranial nerve involvement and distention of the fontanel, are absent. About half of his cases occurred in infants six months of age and under, two-thirds were less than nine months old.

Oseki (*Beitr. z. Path. Anat. u. z. Allg. Path.,* Zeiglerv, 1912, Vol. IV., p. 538), studying the relations between the nervous symptoms and the anatomic changes in latent meningitis in acute infectious diseases, found that in some instances, diagnosed as meningitis clinically, the postmortem revealed a moderate amount of edema and occasionally a very slight opacity of the membranes. Microscopically, definite inflammatory changes with leukocytic and lymphocytic infiltrations in the meninges and brain were detected. The ganglionic cells were changed more or less and definite foci of necrosis were at times found in the brain and cord. The neighborhood of the small vessels in particular presented the inflammatory infiltration, thus constituting an acute meningoencephalitis, the trouble probably starting in the meninges. In other cases, in which clinically the patients presented symptoms of hallucinations, great motor restlessness, rigidity of neck and back, loss of consciousness, jactations, differences in the pupils, etc., the changes were confined entirely to the brain substance (demonstrating the well-known fact that in encephalitis the meningeal symptoms may predominate). The bacteria found in the central nervous system corresponded to those of the original or primary disease.

Oseki also met with cases of pneumonia in which cerebral symptoms were absent during life, though meningitis and encephalitis were found postmortem. In one such case only were the changes macroscopic. These investigations demonstrate conclusively that gross inspection is not sufficient to exclude meningitis or encephalitis; careful microscopic examinations are imperative.

From the standpoint of the bacteriologist, the cases are regarded as serous meningitis or meningismus. The pathologist, however, on a careful examination at the postmortem, finds microscopic or macroscopic lesions, from which the organism can be frequently recovered.

Clinically, we find that nervous symptoms may arise in the course of pneumonia and other infectious diseases without apparent macroscopic changes in the meninges or brain. Distinct meningitis and encephalitis on the other hand, readily appreciated without the aid of the microscope, have been found postmortem, the symptoms during life being identical with those of the first group. In view of the above may we not logically infer that lymphocytic and leukocytic infiltration of the brain and meninges, etc., or plastic localized exudates, in reality explain the so-called meningism in cases that recover, the cerebrospinal fluid being negative.

Furthermore, the occurrence of subsequent degenerate changes in the brain in cases of this category reported by Holt, Blühdhorn and others, clearly shows that the cortex was involved in the initial infection. It would be of great interest if we could follow up the subsequent course of the cases, in order to discover possible secondary mental defects.

Attention has already been directed to the difficulty of diagnosis when the process is limited to the convexity; in the 4 cases reported above the presence of eye symptoms, etc., rendered the diagnosis less difficult. As the patients recovered, pathological confirmation is lacking.

From a study of pneumococcus infection it is evident that the underlying anatomical changes inducing the cerebral manifestations in the class of pneumonia discussed vary within wide limits. We may have a well-developed meningitis or meningoencephalitis without any focal symptoms; that is, when the process involves the so-called silent areas in the brain. On the other hand, we may have cerebral disturbance equally pronounced, in which the postmortem findings are limited to a leukocytic and lymphocytic infiltration with slight edema of the involved parts of the brain and meninges.

The pneumococci are found in the spinal fluid in cases in which the entire cerebrospinal canal is involved.

Localized meningitis or meningoencephalitis with or without a plastic exudate reveals the organism at the local seat of trouble, the cerebrospinal tract not being involved as a whole in the process.

In practice, therefore, it is essential that the clinical history be taken into consideration—for lumbar puncture may not throw any light upon the case. A negative result is not conclusive; only positive findings are of value.

A CASE OF GAUCHER'S DISEASE IN A BOY THIRTEEN YEARS OF AGE. SPLENECTOMY WITH RECOVERY.*

BY CHARLES HERRMAN, M.D.,
Attending Pediatrist to Lebanon Hospital, New York.

SURGICAL REPORT BY HENRY ROTH, M.D.,
Attending Surgeon to Lebanon Hospital.

PATHOLOGICAL REPORT BY EUGENE P. BERNSTEIN, M.D.,
Pathologist to Lebanon Hospital.

The case here reported is the second of Gaucher's disease which has come under my personal observation. The first (Case 5 of Dr. Roth's table) was a boy, three and a half years of age, who came to my service at the Vanderbilt Clinic in 1911. The clinical history was reported by Dr. Reuben in the *American Journal of Diseases of Children,* 1912, Vol. III., p. 28. A splenectomy was performed by Dr. Wiener. The patient died shortly after the operation and a complete pathological report was published by Dr. Mandelbaum (*Journal of Experimental Medicine,* 1912, Vol. XVI., p. 797.)

The subject of Gaucher's disease has been so thoroughly discussed recently in an excellent monograph by Drs. Brill and Mandelbaum (*American Journal of Medical Science,* 1913, Vol. CXLVI., p. 863) that I shall confine myself to a brief clinical history of the present case.

The patient is a boy now fourteen years of age. His mother is healthy; his father had a gastric ulcer for which a gastroenterostomy was performed. There are 8 other children, all apparently healthy, except a sister of seven years, who has a tuberculous coxitis and an enlarged spleen, palpable 5 cm. below the free border of the ribs in the axillary line. It is noteworthy that the 2 children affected are the last of a large family. A similar peculiarity is seen in a certain percentage of cases of Mongolian imbecility. The patient had measles and whooping-cough, but no manifestations of syphilis, tuberculosis or malaria at any time. He first came under my observation in November, 1906, at the age of seven. The mother had noticed an enlargement of the abdomen when he was four years of age. At six and a half years he had severe abdominal pains and epistaxis. A physical examination showed a spleen extending 8 cm. below the level of the umbilicus and 1 cm. beyond the umbilicus in the median line. The edge of the liver was felt 5 cm. below the free border of the ribs in the right mammary line. The lymph nodes were not distinctly enlarged. Examination of the blood showed: Hemoglobin, 75 per cent.; red blood cells, 4,390,000; white blood cells, 4,000; polymorphonuclears, 70 per cent.; lymphocytes, 29 per cent.; eosinophiles, 1 per cent. No plasmodia. Quinin, arsenic, iron, mercury and iodids were given at various times without any apparent effect. In June, 1909, he had a hemorrhage following the extraction of a tooth and in July an attack of severe abdominal pain followed by the vomiting of a large quantity of blood. On July 13, 1909, he was admitted to my service at the Lebanon Hospital and remained in the hospital one month. Physical examination revealed some discoloration of the face, a venous hum in the vessels of the neck, a functional murmur at the base of the heart, an enlarged abdomen measuring 58 cm. at the level of the umbilicus, which increased to 62 cm. during his one month's stay at the hospital. The liver extended from the fifth rib above to 5 cm. below the free border of the ribs in the right mammary line, 3 cm. in the right axillary line and 6 cm. in the parasternal line. The spleen extended from the seventh rib above to 15 cm. below the free border of the ribs in the left axillary line and 1.5 cm. beyond the umbilicus in the median line.

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* To be read at the Annual Meeting of the American Pediatric Society, Stockbridge, Mass., May 26-28, 1914.

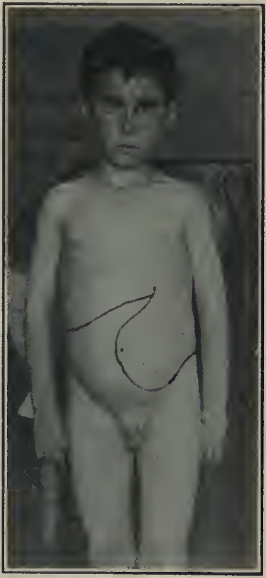

FIG. 1.—The patient, showing enlargement of liver and spleen.

A series of examinations of the blood showed:—

	Hemoglobin.	Red Blood Cells.	White Blood Cells.	Polynuclears.	Lymphocytes.
July 14, 1909.	60%	3,640,000	3,800	56%	44%
" 19, "	50%	3,650,000	3,600	48%	52%
Aug. 3, "	55%	3,620,000	3,400	52%	48%
" 9, "	64%	3,800,000	2,800	50%	50%

A few microcytes and slight poikilocytosis. The urine was acid, of a specific gravity varying from 1,010 to 1,020; no albumin or sugar. The examination of the feces showed nothing abnormal. He had occasional rises of temperature to 101°. He had three attacks of epistaxis, none very severe. His weight on admission was 52½ pounds and during his stay he gained 3½ pounds. He received seven X-ray treatments at intervals of three or four days without any apparent effect. On February 8, 1912, he was presented before the Pediatric Section of the New York Academy of Medicine. Dr. Brill also saw him at that time and made a positive diagnosis of Gaucher's disease. Shortly after this I noted the enlarged spleen in the younger sister and the diagnosis seemed more probable. On August 1, 1912, I made the following notes: The patient has a slight hemorrhage from the nose nearly every day when he sneezes or blows his nose. Anemia more marked. Some discoloration of the face, especially around the nose, of a yellowish-brown hue. Thickening of the conjunctivæ of a yellowish color on either side of the cornea. The spleen fills the greater part of the left half of the abdomen and reaches 2 cm. beyond the median line. The liver 5 cm. below the free border of the ribs in the right mammary line. The axillary and inguinal nodes are palpable

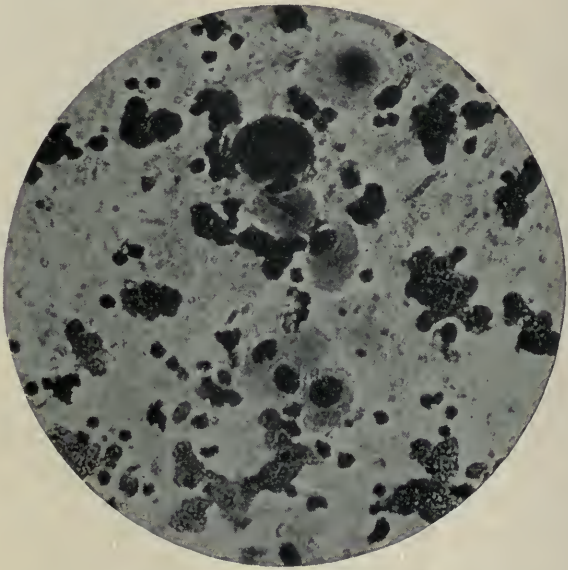

Fig. 2.—Smear from spleen pulp showing large cells with multiple nuclei, erythrocytes in masses and rouleaux. Few lymphocytes.

but not large. A venous hum is heard in the vessels of the neck, but no systolic murmur at the base of the heart. Wassermann negative; von Pirquet negative.

On October 17, 1913, he was again admitted to my service. During the preceding two weeks he had had several severe hemorrhages from the nose and gums and was very pale. On one occasion he lost 6 ounces of blood. He complained of feeling badly, had lost weight and was troubled with headache, dizziness, dyspnea and nausea. He was so distinctly worse that I decided to have a splenectomy performed. This was done by Dr. Henry Roth on October 22. The patient made a good recovery and was discharged December 11, 1913. He then spent four weeks in a convalescent home in the country, gained nearly 10 pounds in weight and improved greatly. He still complains of occasional pains in the abdomen and legs. It is interesting to note the changes which took place in the blood following the removal of the spleen:—

Date.	Hemoglobin. Per cent.	Red Blood Cells.	White Blood Cells.	Poly-nuclears. Per cent.	Lympho-cytes. Per cent.	Eosino-philes. Per cent.	
Oct. 18.	45	3,420,000	5,800	47	52	1	
" 21.	45	3,900,000	4,000	48	50	2	
" 22.							
OPERATION.							
Oct. 28.	55	3,140,000	15,000	71	25	3	
Nov. 3.	55	3,200,000	10,000	75	21	4	
Dec. 3.	45	4,200,000	22,800	65	35		Otitis (mild attack).
" 9.	52	3,300,000	15,000	62	35	3	

Of the 15 authenticated cases only 3 have occurred in males. Of these 3, 2 have come under my observation. These are also the only 2 males thus far operated upon.

To sum up the principal features, the patient presented the following manifestations: A disease beginning before the age of four and running a chronic course; a marked enlargement of the spleen and a moderate enlargement of the liver; no distinct enlargement of the lymph nodes; a yellowish brown discoloration of the face, especially about the nose and a wedge-shaped thickening of the conjunctivæ on either side of the cornea; a persistent leukopenia and a tendency to hemorrhages, especially from the nose. The size of the liver and spleen did not change materially during the seven years that the patient was under observation. As the disease progressed the blood showed a marked decrease in the percentage of hemoglobin (from 75 to 45), a less marked decrease in the number of red blood cells (4,390,000 to 3,400,000), a constant leukopenia with a gradual decrease in the percentage of polymorphonuclear leukocytes (70 to 48). As a result of the removal of the spleen there was an increase in the percentage of hemoglobin and an increase in the number of red blood cells and a much more marked increase in the number of white blood cells (from 4,400 to 15,000), with an increase in the percentage of polynuclear cells (49 to 75).

It is too early to say that the patient is cured. That he has been very much benefited by the operation there can be no doubt. The spleen, although most markedly, is not the only organ affected, but it does not seem likely that an organ so distinctly changed can be of any value, and it may be that by removing it the body may be better able to cope with the as yet unknown toxic agent causing this disease.

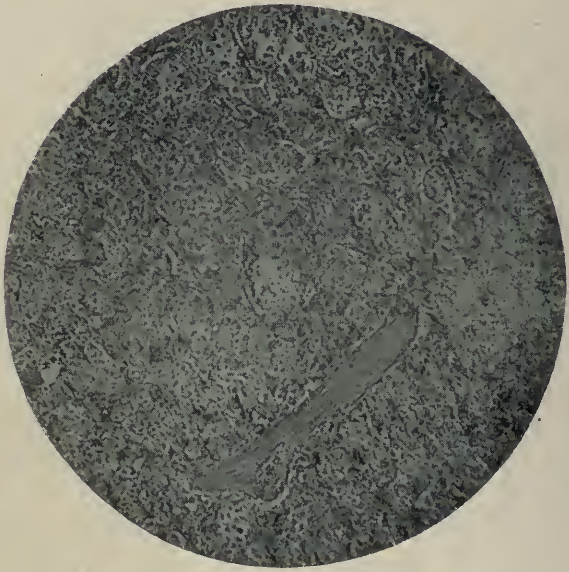

FIG. 3.—Low power of section of spleen showing venous sinuses.

In a recent paper, which appeared in the *Jahrb. für Kinderhk.*, January, 1914, Dr. Niemann reports a case of what is undoubtedly one of Gaucher's disease in an infant seventeen months of age from Czerny's clinic in Berlin. Curiously enough, his paper is entitled "Ein Unbekanntes Krankheitsbild" (An Unknown Disease or Symptom Complex). The clinical findings and pathological changes are those of Gaucher's disease, and the author himself thinks this diagnosis highly probable. The unusual features of the case are the early age at which the first symptoms were noted and the rapid course, ending in death. Cases have been already reported in young children and the disease does not necessarily occur in more than one member of the family. The author proposes the name "grosszellige drusen metamorphose" (large-cell glandular metamorphosis). The term "splenomegaly" is discarded because the disease is by no means confined to the spleen, and he prefers the term metamorphosis to hyperplasia because the pathological changes are more striking than is the increase in size. However, it seems likely that the term Gaucher's disease will be the one commonly used. Another interesting item in Niemann's case was the presence of a positive Wassermann reaction, notwithstanding which antisyphilitic treatment had no effect and the postmortem examination showed an entire absence of any syphilitic changes. The case proves that a positive Wassermann reaction is not absolute proof of the presence of congenital syphilis.

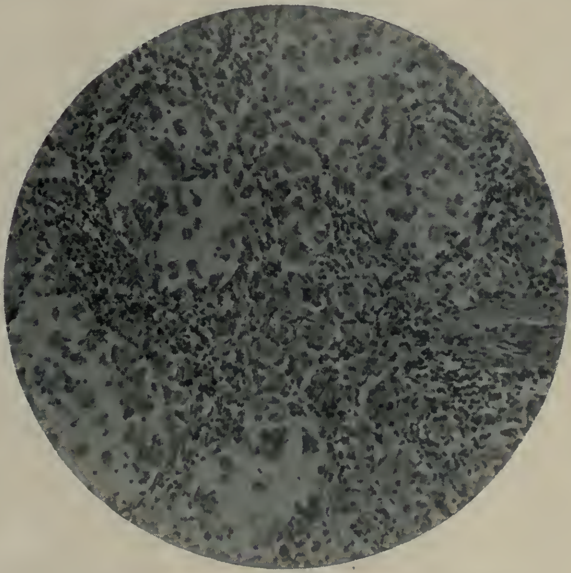

FIG. 4. High power showing sinuses distended with multinucleated endothelioid cells and erythrocytes.

Now that a series of papers recently published have called attention to this rather rare disease, I have no doubt that a number of new cases will be reported within the next few years.

SURGICAL REPORT.

On October 22, 1913, under nitrous oxid gas and ether anesthesia, a vertical incision was made through the outer border of the left rectus muscle, sufficiently long to permit safe manipulation and delivery of the enlarged spleen. Adhesions were present on the upper and posterior surfaces, which were readily divided after the vascular pedicle was first secured with a rubber covered clamp, ligated in sections with catgut and divided between ligatures. An attempt was made to separate the tail of the pancreas from the pedicle, but owing to some bleeding this was abandoned and the distal one inch of the pancreas was included in one of the ligatures and part of it was removed with the spleen. After covering the raw surface with peritoneum, a small cigarette drain was placed down to the stump. The abdominal incision was closed by several layer sutures. The patient stood the operation remarkably well. There being no discharge from the wound, the drain was removed on the third day and the wound healed by primary union. He was discharged from the hospital forty-nine days after the operation.

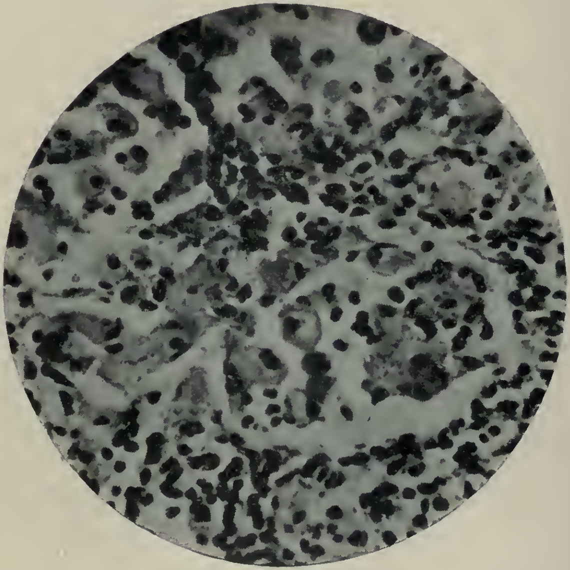

FIG. 5.—High power of several sinuses showing large multinucleated cells, erythrocytes and lymphoid elements.

In a recently-published article on large-cell splenomegaly (Gaucher's disease), N. E. Brill and F. S. Mandelbaum (*American Journal of Medical Science,* 1913, Vol. CXLVI., p. 863) state that of the 14 authenticated cases of this disease, 8 had splenectomy performed, with 5 recoveries and 3 deaths as the result of the operation.

J. F. Erdmann and J. J. Moorhead (*American Journal of Medical Sciences,* February, 1914, Vol. CXLVII., p. 312) give a list of 10 operative cases, including 2 of Wilson's cases, which Mandelbaum, however, does not consider to be types of the disease under consideration. Furthermore, the one authenticated case of Gaucher's disease (G8869), reported by Wilson and operated by Wm. J. Mayo on January 7, 1907, died. Erdmann and Moorhead are in error when they count this case as a recovery. A corrected list shows only 8 operative cases, with 5 recoveries and 3 deaths.

The following is a tabulated list of cases submitted to operation:—

Priority of publication	Author and date of publication	Sex and age	Blood picture	Operator and date of operation	Weight and size	Outcome	Duration of enlargement	Other cases in family	Priority of operation
1	Picou and Ramond 1. 1896	Female 32 yrs.	Simple anemia	? 1895	2800 gms.	R.	4 years	?	1
2	Bovaird 2. 1900	Female 16 yrs.	"	A J. McCosh May 17	12½ pounds	Died in 3 hours	13 years	Yes	2
3	v. Herczel 1907	Female 37 yrs.	"	E. v. Herczel Sept. 27, 1905	3 Kg. 32x16x12 cm.	R.	4 years	Yes	3
4	de Jong and von Henkelom 1910	Female 12½ yrs	"	von Rossem March 1, 1912	1850 gms. 26x15x7 cm.	R.	6½ yrs.	Yes	5
5	Mandlebaum 1912	Male 4½ yrs.	"	J. Wiener March 1, 1912	490 gms. 18x9.5x5 cm	Died next day	1 year	Yes	6
6	Wilson G. 8869 1913	Female 27 years	"	W. J. Mayo Jan. 7, 1907	30x20x8 cm. 5280 gms.	Died	15 years	?	4
7	Downes 1913	Female 28 years	"	William A. Downes Dec. 14, 1912	1813 gms. 35x13.5x6.5 cm.	R.	15 years	No	8
8	Erdmann and Moorhead 1913	Female 3¼ yrs.	"	J, F. Erdmann June 6, 1912	430 gms. 17x10.5x7 cm.	R.	2 years	Yes	7
9	Herrman 1914	Male 13 years	"	Henry Roth Oct. 22, 1913	1320 gms. 27x13x10 cm.	R.	10 years	Yes	9

SUMMARY

Female, 7. Male, 2. Recovered, 6. Died, 3.

Oldest, thirty-seven years; youngest, three years. Other cases in family, 6.

Longest duration, fifteen years; shortest, one year.

The patient presented by Dr. Charles Herrman is, therefore, the ninth operative case and the sixth recovery after splenectomy for Gaucher's disease. It is the third male case on record and the second male case subjected to splenectomy. It is the sixth patient operated upon in this country.

In view of the fact that all other forms of treatment have thus far failed to bring about the same amount of improvement which follows splenectomy, the latter procedure seems justifiable because, even if the improvement proves to be only temporary, splenectomy will surely relieve the symptoms caused by the increased size and weight of the spleen. Furthermore, the improvement in the condition of the blood tends to indicate that the removal of the spleen in this disease has a beneficial effect. Splenectomy is a comparatively safe operation, providing it is done before the general condition of the patient becomes such that any other procedure of such magnitude is too dangerous.

PATHOLOGICAL REPORT.

The spleen in this case measured 27 x 13 x 10 cm. in its various dimensions and weighed 1,320 grams (almost 3 pounds).

The surface was wrinkled and of a translucent purple color.

On cut section the capsule is seen to be somewhat thickened. The parenchyma is of a brownish-red color, mottled everywhere with minute hemorrhagic areas about the size of a pin-head. The organ cuts with considerable resistance, nowhere exuding blood, and presents a firm homogeneous surface from which very little pulp can be scraped off. Malpighian bodies are not distinguishable.

While the microscopic picture of this disease is absolutely diagnostic, yet the interpretation of the findings is still in doubt.

In spreads made from the splenic pulp immediately after operation, fixed in methyl alcohol, and stained in Giemsa's solution for twenty-four hours, we see numerous large endotheloid cells, with irregular outlines, containing one or more fairly large, round or ovoid shaped nuclei, which are rich in chromatin and are usually situated eccentrically. The number of nuclei in one cell may be very large—in this case the highest counted being seven. The protoplasm of the cell is roughly homogeneous. Phagocytic cells could not be found. (Fig. 1.)

On microscopic section the most prominent feature is the enormous distention of the venous sinuses, which are filled with erythrocytes and the above described endotheloid cells. The sinuses are round or oval in shape and lined with endothelium. Some sinuses, however, appear to be empty except for a few cells scattered along the endothelial wall. Here and there are found islands of fairly normal pulp. (Fig. 2.)

The wall of the sinuses is composed of connective tissue supporting the endothelial cells, but reticulum fibers are never found extending into the lumen of the alveoli.

This is the typical pathological picture of the spleen in this disease, which still remains to be explained.

The American pathologists are inclined to favor the theory that these large cells arise from the endothelium lining the sinuses, while the Germans claim that they come from the reticulum. As no transition stage from either source has been seen, both theories are unproved. Still others suggest their derivation from the lymphocytes—also without substantiation.

The possibility of a protozoon as the etiological factor has been advanced, but all cultural and animal experiments to prove this have given negative results.

In this case cultures were made aerobically and anaerobically after the method of Noguchi, but without result.

The only point of accord among all authors is that these cells must arise from the hemopoietic system.

Besides being found in the spleen they are also present in the liver, lymph nodes and bone marrow.

THE RELATION OF THE BORDET-GENGOU BACILLUS TO THE LESION OF PERTUSSIS.—Mallory (*Journal of Medical Research*, March, 1913) has shown that the Bordet-Gengou bacillus is not a secondary invader in whooping-cough, but is actually a causal factor. All of Koch's laws have been satisfied in this respect. The organism has been recovered from the respiratory tract of such cases, has been insolated in pure culture and has been shown to produce in animals lesions of a similar pathological nature to those found originally.—*Boston Medical and Surgical Journal.*

THE ORGANIZATION OF AN OUT-PATIENT CLINIC.

BY RICHARD M. SMITH, M.D.,
Boston.

It often happens that work in an out-patient department is considered uninteresting and, as a result, the efficiency of the service rendered is not as great as it might be. There are several reasons for this.

It is necessary, to obtain the best results, to have a chief of clinic with a continuous service who can formulate and carry out one policy throughout the year. Otherwise one man is on duty for so short a time and the number of men in charge during one year is so great that the method of running the clinic and the treatment of patients lack consistency and uniformity.

Frequently one physician has to see so many patients that he has no time for the thorough examination or study of any single individual. If one man sees only new patients every day he has no opportunity to follow the subsequent course of these patients. There should be enough men on duty at the same time so that no man lacks time for careful consideration of each patient. Every physician on duty should have at least certain days when he is not compelled to see new patients, but may devote himself to patients whom he has seen previously and wishes to follow.

In the Children's Out-Patient Department of the Massachusetts General Hospital two men are on duty at the same time and each one sees the new patients on alternate days. The man who sees new patients on Monday, Wednesday and Friday asks these patients to return on Tuesday, Thursday or Saturday, when he is free to see them. This adds much to the value of the clinic for the physician and establishes a personal relationship between physician and patient, which is beneficial to both. If the patient presents no condition which requires special study he is allowed to return on any day when convenient to himself and is seen by the junior house officer. If he presents a condition which is being studied by some other physician in the clinic, he is seen by that man on subsequent visits.

The treatment of many patients, in fact most patients, in a

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* From the Children's Medical Department, Massachusetts General Hospital, Boston. Fritz B. Talbot, M.D., Chief of Service.

children's clinic demands a knowledge and appreciation of the home conditions and environment. This contribution can be made only by a social worker. It seems to me that the time is past when it is possible to conduct an out-patient clinic without social workers. These workers must be trained especially for their positions and be thoroughly familiar with the problems of infancy and childhood. They should be closely connected with the clinic, so that there shall be no separation of their work and the physician's. The results of their study should constitute a part of the patient's record. We have found it advisable to have a worker for infants and one for children, with assistants and volunteers working under them—perhaps some other division of labor would be better in other clinics.

Showing Physician and Social Worker at work side by side in dispensary.

Once a week a conference is held between members of the medical staff and the social workers. Matters of general interest with reference to the clinic are discussed and particular cases presented. The medical history of each patient is given by the physician who has been following it and the social history given by the worker. Then the general problem or the specific difficulty which that case presents is discussed by the whole group. This conference serves as a means of keeping all members of the department informed about what is taking place in the clinic, and also gives each patient the benefit of the combined advice of the staff of physicians and social workers. The conference has proved of distinct benefit.

Twice we have had a clinic survey. The records of all patients coming to our department during a certain period of time were studied and the facts indicated on the blank below were ascertained. We were able by this means to find out exactly the kind of a clinic we had. The diagnoses showed us at once the large number of normal infants who came to us simply for regulation of feeding; the larger groups of children with heart disease, and so on with other conditions. It also revealed the fact that a considerable number of patients were seen only once, obviously indicating poor service. It told us what percentage of cases received laboratory tests and the ultimate results of our treatment. It served definitely to indicate the problems with which we had to deal and the places where we needed to make greater effort for efficient work. Such surveys are valuable contributions to a clinic.

FORM OF BLANK FOR CLINIC SURVEY.

Name Age Sex O. P. D. No.

Residence Birthplace

Diagnoses (dates, if noted)

Date of 1st visit (Children's Clinic) Date of latest visit (Ch. Cl.) Total No. visits

Ref. from Clinic Date No. visits

“ to “ “ “ “

Trans. from “ “ “ “

“ to “ “ “ “

Other clinics dealing with child April 1st

“ “ “ “ “ August 1st

Condition as noted on latest visit to Ch. Rm. (Rpt. to Aug. 1st)

Results Unsatisfactory

Pt. attending regularly, but no results
“ failing to attend
Any note on record of advice to return?

Results Satisfactory

Treatment followed: Pt. improved
“ “ “ cured

Laboratory Tests

Urine analysis
Sputum
Blood
Stool
Wasserman
Vaginal smear

Cases pending, Aug. 1st

Pt. ref. to House Date Diag. Cond. on disch.

Asked to rpt. at O. P. D.? Reported? Date

Referred to other Institution

Social record

Any individual patient becomes of greater interest if he can be studied in relation to other patients who present the same or a similar condition. We have divided our cases into groups, which were determined by the survey. As a rule, all the patients falling into one group are seen by one physician and by one social worker. In one group of cases, the cardiac, one physician sees the patients on a given day the year through, thus insuring continuous and uniform treatment.

The relation of any particular patient and the disease which he has to that disease as it exists in the community is presented by this group study in a way which would be impossible from a consideration of isolated cases. One is at once impressed with the intimate connection between out-patient work and the work done by various public health and relief agencies in the city. Coöperation with these agencies in dealing with an individual child and in the study and removal of causes of disease becomes a necessary part of one's work. The chart on page 354 shows the organization of the Children's Medical Out-Patient Department of the Massachusetts General Hospital as it has been worked out since July, 1910, when Dr. Talbot was appointed Chief of the Children's Medical Department.

The upper part of this chart presents in a graphic way the co-operation and inter-relation of the children's department with other departments in the hospital. Certain groups of cases are treated by two or even three departments, thus giving the patient the benefit of expert care in each particular field.

The lower portion of the chart shows the personnel of the department. The chief of service is in charge of the whole children's department of the hospital, wards and out-patient, and directs the general policy of both. The assistant visiting physician is in direct charge of the out-patient department. Both services are continuous throughout the year. The physicians to out-patients are on duty six months and the assistant physicians four months. They see new patients and special groups taken for study. All the persons above the line are working for the clinic and each has a definite responsibility. The persons mentioned below the line are in the clinic to be taught and do not have any work to do except as specifically assigned to them. The work they do is primarily for their own instruction, not for the benefit of the clinic.

The chart on page 355 shows the grouping of patients.

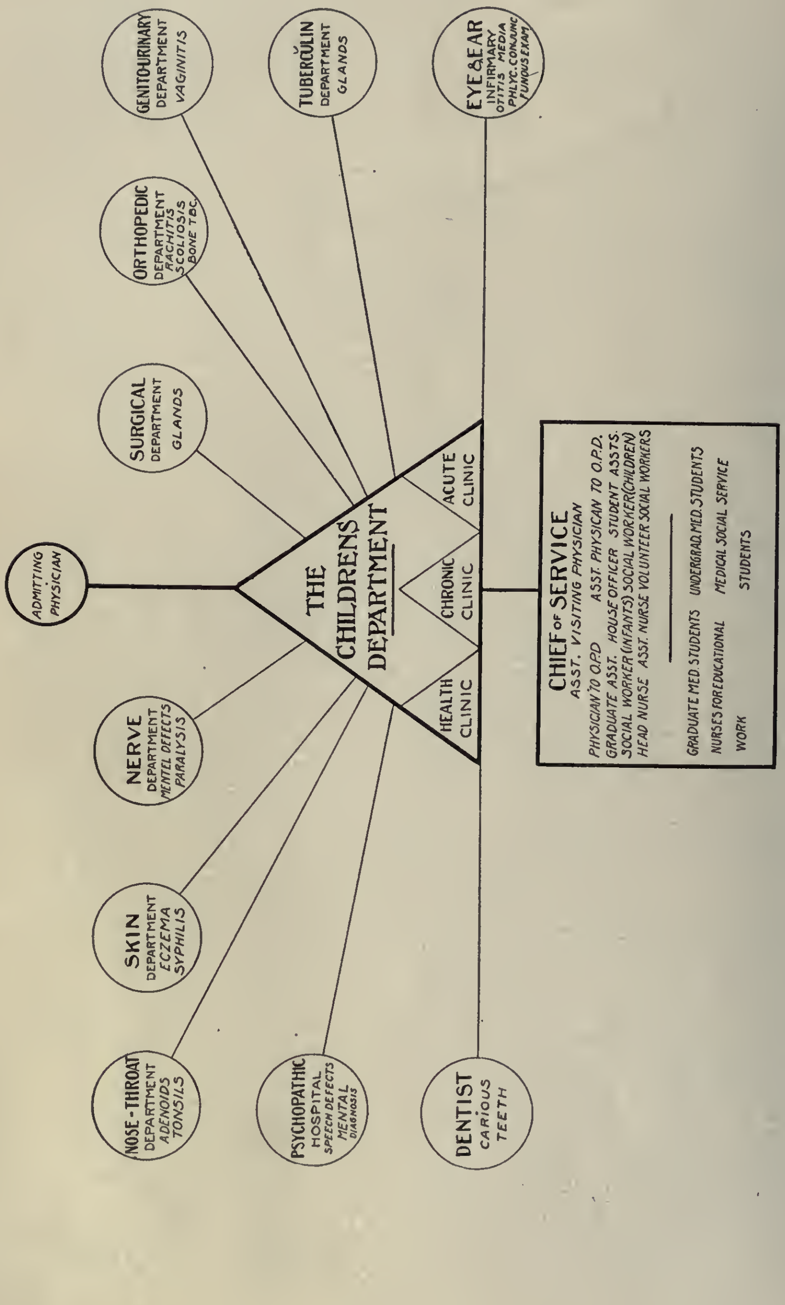

ADMITTING PHYSICIAN
THE CHILDRENS DEPARTMENT
HEALTH CLINIC
CHRONIC CLINIC
ACUTE CLINIC
SURGICAL DEPARTMENT GLANDS
ORTHOPEDIC DEPARTMENT RACHITIS SCOLIOSIS BONE TBC.
GENITO-URINARY DEPARTMENT VAGINITIS
TUBERCULIN DEPARTMENT GLANDS
EYE & EAR INFIRMARY OTITIS MEDIA PHLYC. CONJUNC FUNDUS EXAM.
NERVE DEPARTMENT MENTEL DEFECTS PARALYSIS
SKIN DEPARTMENT ECZEMA SYPHILIS
NOSE-THROAT DEPARTMENT ADENOIDS TONSILS
PSYCHOPATHIC HOSPITAL SPEECH DEFECTS MENTAL DIAGNOSIS
DENTIST CARIOUS TEETH
CHIEF OF SERVICE
ASST. VISITING PHYSICIAN
PHYSICIAN TO O.P.D
ASST. PHYSICAN TO O.P.D.
GRADUATE ASST.
HOUSE OFFICER
STUDENT ASSTS.
SOCIAL WORKER (INFANTS)
SOCIAL WORKER (CHILDREN)
HEAD NURSE
ASST. NURSE
VOLUNTEER SOCIAL WORKERS
GRADUATE MED. STUDENTS
UNDERGRAD. MED. STUDENTS
NURSES FOR EDUCATIONAL WORK
MEDICAL SOCIAL SERVICE STUDENTS

Chart showing graphically the organization of the Massachusetts General Hospital Children's Department Out-Patient Clinic.

HEALTH CLINIC			CHRONIC CLINIC			
Infant Feeding	**Diet after Infancy**	**Hygiene**	**Rachitis**	**Anemia**	**Enuresis**	**Mental Defects**
Medical Supervision Co-operation with Milk Stations Home Visits Breast Feeding Milk Home Modifications Laboratory	Medical Supervision Home Lessons Diet Kitchens Candy Money	Medical Supervision Co-operation with Visiting Housekeeper Vacation Associations School Nurses Home Supervision Food Charts	Co-operation with Orthopedic Dep't. Causes Diet and Hygiene Hospital Care Convalescent Homes Family Oversight	Causes Medical Treatment Diet Home Conditions Country Care		Co-operation with Nerve Department Psychopathic Hospital Medical Diagnosis Heredity Institutional Care
Aim	Aim	Aim	Aim	Aim	Aim	Aim
Well Babies Intelligent Mothers	Well Children	Well Children	Cure of Disease Prevention of Deformity			Cure if Possible Segregation
Problem			Problem			Problem
Infant Mortality			?			Feeble-mindedness Delinquency

ACUTE CLINIC					
Cardiac Disease	**Tuberculosis**	**Vaginitis**	**Lungs except Tuberculosis**	**Syphilis**	**Infantile Diarrhea**
Prolonged Supervision Hospital Home Convalescent Hospital After Care Amusement Instruction Vocational Guidance Co-operation with: School Teachers School Nurses	Co-operation with: Surgical Department Orthopedic Department Skin Department Tuberculin Department Tuberculosis Societies Home Care Institutional Care Examination of Family	Co-operation with: Genito-Urinary Dep't Board of Health Regular Treatment Source of Infection Examination of Family Prophylaxis	Medical Diagnosis Etiology	Co-operation with: Skin Department Feeding of Infants Examination of Family	Study of Causes Home Care with Visits After Care Prevention
Aim	Aim	Aim	Aim	Aim	Aim
Cure if Possible Self-Supporting Individuals	Prevention and Control of Disease	Cure of Patient Suppression of Disease in Community		Cure of Patients Protection of Future Children	Cure of Patient Prevention of Spreading
Problem	Problem	Problem		Problem	Problem
Industrial Training	Prevention and Control of Tuberculosis	Sex Hygiene		Sex Hygiene	Infant Mortality

Chart showing grouping of patients.

In general there are three main divisions—the health clinic, really preventive medicine; the chronic clinic, requiring supervisory care; the acute clinic, patients who are ill. The health clinic patients are seen in a room by themselves, so that as far as possible they are not exposed to infection from those acutely ill. The largest group is that of infant feeding. Many babies seen only once are referred to a milk station for further supervision. One physician sees all these patients and one worker visits in their home. We try to keep the babies on breast feeding. If bottle feeding is necessary we urge home modification whenever it seems practicable. We use modifications made in the laboratory in many instances. We are able by an arrangement with a milk concern to secure certified milk either unmodified or of a modification at a price adapted to the income of the individual family. Each case is investigated and the price determined upon by our worker. After the patients have been to the hospital they are visited at home and taught how to do the things which have been told them in the clinic. We are trying to keep the babies well and to reduce the infant mortality.

In the chronic group rickets serves as an example. These patients are taken care of in co-operation with the orthopedic department. We direct the general medical care with the home visits and regulation of hygiene. The orthopedic department prevents or corrects deformities as they arise. We have conducted an investigation into the causes of the disease. We take an oversight of the other members of the family to prevent if possible the development of rickets in the younger members.

In the acute clinic one of our largest groups is the cardiac. We consider together all cases of endocarditis, chorea and rheumatic fever. The most important feature in this group is the length of time over which supervision is necessary. During the acute stage of the disease we have adopted two methods of treatment, either placing the patient in the hospital or treating in bed at home. The first method has certain advantages in that there is more intimate medical care, but the home treatment also has points in its favor. The child is at home. The parents are being educated in how to care for heart disease. The expense of hospital board is saved. When patients are taken care of in their homes, visits to the clinic are obviously impossible, but frequent house visits are made by the worker. It is of course

First stage in the home care of patients with heart disease.
Complete rest in bed.

necessary to have a worker who understands the theory and the practice of the treatment of heart disease. We are sure that our worker does understand this and her judgment can be relied upon when she reports to the physician in the clinic on the condition of the child. In some instances we have called upon a

Second stage in the home care of patients with heart disease.
Bed with a little occupation.

local physician to make a visit and report on his examination. After the acute stage is past we try whenever possible to conduct the convalescent care at home. Visits to the clinic can be made at occasional intervals for examination. In the majority of instances the worker can perfectly understand the simple requirements of treatment and co-operate in the carrying-out of the necessary rules. If a convalescent hospital is to be used, it must be a hospital or home where especial care is given to heart cases. In our experience these patients almost invariably do badly in a general convalescent hospital. After a considerable period of gradually increasing activity the children can be allowed to go to school. By co-operation with the school nurses and teachers these children can be put on first-floor rooms and watched to prevent over-exertion. During the period of enforced quiet, varying from weeks to months, as the case may be, some sort of amusement is provided adapted to the ability of the in-

Third stage of home care of patients with heart disease. Dressed, but under restraint.

dividual child. We have a loan collection of games and occupations which the children use as they are able. We also provide persons to read to them and to give lessons to those who are well enough to study. We hope to be able to direct these children eventually into occupations where their physical handicap will not be a barrier to the earning of a living. There is given below a schedule showing the method of study used in this group.

HEART SCHEDULE.

Name Age Birthplace O. P. D. No.
Address Nationality S. S. D. No.

ENVIRONMENT.

Neighborhood: Open Congested Roof Porch Yard
Tenement { front floor No. families No. Rooms { dark light
Condition of cellar { wet dry Hallway { dark light Toilet { where condition
What was environment of family before coming to America { work in fields work in shops
Did they live in country or city
When did parents come to America
Any other children in family born in America If so, did they have heart lesions
Any other children in family born abroad If so, did they have heart lesions
Date first visit to O. P. D. Was patient breast fed
Diagnoses previous to heart or chorea Dates
Date of heart or chorea diagnosis Date of first symptom, if possible
Summary of physical examination at this time:
a. Heart measurements Murmurs
b. Question of chorea Large tonsils Rheumatism
c. Is broken compensation noted
Significant facts in previous physical history { Scarlet fever Measles Diphtheria
Have other members of family had heart lesions Rheumatism Frequent sore throat Chorea Nephritis
With what results:
Cure Death Loss of work
By whom was patient sent to O. P. D.
For what complaint
Date referred to S. S. D.
Disposition of patient:
1. Hospital (M. G. H.) How long Condition on discharge
2. Home Why Dates How treated Results Difficulties
3. West Newton Why Dates Results Difficulties
4. Other disposition Why Dates

Hygiene
Food { Regularity
Food { Suitability
Sleep { No. of hours in bed during night
Sleep { No. of hours in bed during day
Does patient sleep alone   Windows open   No. of occupants in room
Recreation   Outdoors
Who has care of child   Is she sensible about hygiene
Is patient under proper discipline   Are parents co-operative
Any reason why patient should not have good care

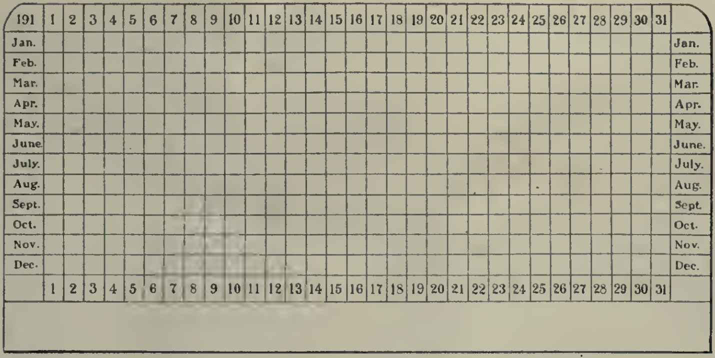
Need of tonsillectomy indicated   Done   Dates
Need of dentistry indicated   Done   Dates
Any digestive disturbances indicated
Summary of important steps in medical and social treatment, including:
Progress of disease
Improvement of disease
Possible sources of infection
Treatment   Kind
Recurrences of attacks
Length of time under supervision

School
Loss of time
Grade
How much able to do after return   What grade
Any school, vocational or other instruction during treatment

In the chart of organization several columns are left imperfectly filled out. These represent groups which are recognized as constituting a distinct problem for study, but which as yet have not been undertaken by any individual. Some of these groups are at present under investigation, and as soon as results are secured the further line of treatment will be determined.

No amount of organization will produce returns without some method of following up patients to insure their returning to the clinic and to learn the result of treatment. We have used a method shown on the card below:—

NAME	O. P. D. No. S. S. No.
ADDRESS	
DR	SOCIAL WORKER
DIAGNOSIS	



191	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Jan.																																Jan.
Feb.																																Feb.
Mar.																																Mar.
Apr.																																Apr.
May.																																May.
June																																June.
July.																																July.
Aug.																																Aug.
Sept.																																Sept.
Oct.																																Oct.
Nov.																																Nov.
Dec.																																Dec.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Reverse side of card.

The physician indicates by a line on the back of the card the day he wishes the patient to return. This card is filed on a visible index-file under the day indicated. If the patient fails to report a postal is sent saying:—

MASSACHUSETTS GENERAL HOSPITAL.

BOSTON,....................

Dr. .... is anxious to know your present condition. Please call at the Out-Patient Department at 8:30 A.M., on .... and present this card, when you will be able to see him without delay.

If the patient does not respond to this, someone visits at his home. When he reports his card is removed from the file, the visit crossed and the card clipped to the record. The patient is sent to the physician whose name appears on the card. Subsequent visits to be made are again recorded by the physician and the card returned to the file.

Organization and machinery may be perfect, but it is necessary to keep it in operation. The clinic will not run itself. We have therefore appointed a clinic manager, a non-medical person, whose sole duty it is to superintend the running of the clinic. She sees that patients are examined as promptly as possible and seen by the right physician, that they go promptly to other departments if necessary, that they are instructed when to return, that the records are properly filled out and she runs the follow-up sys-

Clinic Manager—Follow up File on left.

tem. She is an administrative officer and has become an indispensable part of the clinic.

Out-patient work may be extremely interesting and profitable. Each clinic presents its own problems, but we feel that the organization here described has made our clinic for us a pleasant and a worth-while place to work, and we hope a place where patients received good treatment.

329 *Beacon Street.*

INSURANCE AGAINST SMALL-POX.—Belief in the efficacy of vaccination against small-pox is surely attested when it is made the basis for insuring the vaccinated against contracting the disease. An English public vaccinator states that for the past eleven years he has offered, in connection with every vaccination showing four good vesicles, $250 if small-pox is contracted within ten years. At a time when small-pox was prevalent in his community, he gave a written undertaking to pay the sum of $4,000 to any clergyman who submitted to revaccination and who contracted small-pox as a result of a daily visit to the patients in the small-pox hospital.—*Monthly Bulletin, New York State Department of Health.*

CARE OF THE NEW-BORN.*

BY C. G. LEO-WOLF, M.D.,
Buffalo, N. Y.

Judging from the cases I see almost daily, both in my own practice and in consultation, and judging, further, from the careful perusal of recent American pediatric literature, it seems to me that there are a number of points in "the care of the new-born" which will bear repetition, and which have to be still further emphasized before they become the property of our profession.

The first point is the feeding of the new-born. This is, unfortunately, still in the hands of the obstetrician and the general practitioner, with the result that we are often called in many times too late to repair the damage done by injudicious overfeeding, both at the breast and with the bottle.

How long are men and authors of the highest reputation, such as Holt, Fischer, Kerley, Rachford, and others, going to teach students and practitioners that babies should be nursed every two hours from the very first up to the second month; later, every two and one-half hours, and, what I consider still worse, advise this in their books destined for the guidance of young mothers, as do Holt and Kilmer?

I used to advise this myself, and my little patients had to suffer for it. Since I have reformed and use a little more common sense in the care of the new-born entrusted to me, I have had a larger percentage of mothers who are able to nurse their babies and the little ones were better behaved, showed a better gain and were more resistant to infections and to climatic changes. The first ones to observe the improvement and to appreciate the marked lessening required in the care of the new-born were the nurses, who almost daily express to me their appreciation of the value of more infrequent nursing.

Immediately after birth, both the mother and the new-born are exhausted, the one by his passive and the other by her active labors, and what they require is a good, long twenty-four hours' rest. The baby does not need any food at this time, nor could he get any at the breast, beyond a very few drops of colostrum, which will give him the gripes at that. He comes into the world well nourished and has enough to do to adapt himself to his new surroundings, to the change in his circulation and the unaccustomed act of respiration, without our subjecting him to further loss of energy from repeated and purposeless nursing, which tires him and the poor mother, and, besides, gets him so disgusted with his fruitless efforts that he will soon, showing more sense than the physician, refuse the breast altogether. This is a frequent cause of our having had so much trouble in making the babies take the breast and why we have been unable in many a case to make them nurse at all, even after the milk supply has become plentiful.

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* Read before the Pediatric Section of the New York State Medical Society, April 29, 1913.

On the second day, after both mother and infant have had a good rest, we let the baby take the breast once or twice, so that he can get some colostrum, which by now will be present in larger quantities in the breasts. This will clean his bowels of meconium. If he cries much, we give him as much water as he wants.

On the third day we have him nurse three times, four on the fourth day, and from the fifth day on we feed him every four hours in daytime, but never at night. This gives him five feedings daily, usually at 6 and 10 A.M., and at 2, 6 and 10 P.M. If he sleeps, he is never awakened, but it is surprising to see how soon the little ones get accustomed to this regime, and how well they know when it is time for nursing.

Try this regime once yourselves; observe the rested condition of the mothers after they have had a full night's rest every night from the time the baby is born; how they have a plentiful supply of good milk without resorting to any special disagreeable and nauseating diet of over-large amounts of liquids, which are supposed to produce milk, while, as a matter of fact, they do not, but rather prevent it. I allow my nursing mothers to eat anything they want after they have had their first refreshing sleep, and I no longer place any restrictions upon their diet, so long as they are getting sufficient nourishment to keep in good health; observe, also, the good condition of the babies; how quietly they sleep and the look of contentment upon their faces; try it only once, and I am sure you will become as enthusiastic adherents of this method as I am myself.

In the cases in which we do not succeed in getting a sufficient milk supply, and in which we have to resort finally to unnatural feeding, though the number of these cases should never exceed 10 per cent. in the practice of any man, I also have adopted the four-hour regime with the best of results.

It is not my purpose to go into detail about what to give the newborn in the bottle, but if you will only take the trouble to find out what awful mixtures our friends, the obstetricians and the general practitioners, are in the habit of prescribing, then you will agree with me that in hospital cases the infants should be placed under the pediatric service right from birth, as soon as regular and efficient breathing is established, and that in private practice it would be better to call in a pediatrician in the beginning to put the infants on the right track from the very first, rather than wait until their health is impaired from improper feeding and improper food, and to have to repair the damage already done as best we can.

By placing the new-born in the pediatric service from the very first, we will have another advantage which, to me, seems to be of the greatest importance, namely, that we have the nurses of the pediatric service take care of the infants. The lochia of the mothers always contain pathogenic bacteria in large numbers, which may easily be transferred by the nurse's hands to the navel or the skin of the newborn, there to cause infections which we cannot explain in any other way. Or, as I have seen it done, to my great surprise and chagrin, the bathtub, which is for the use of the infant only, may at times serve as a receptacle for soiled linen from the mother's bed.

In private practice, whenever the people can afford this, I insist on having two nurses, one who takes care of the mother only, the other to be in charge of the infant. Where this is impossible, I insist on the nurse giving the baby its bath with disinfected hands in the morning before she changes the puerpera, and on her using rubber gloves for this latter duty. Quite naturally, I insist that the baby's bathtub be used for nothing else, and in the hospital we should do away with the common bathtub altogether and have individual basins for each little patient.

Another point in the care of the new-born in which some of the authors mentioned before are still adhering to old and deleterious teaching, especially in their books intended for the use of mothers and nurses, is the routine wiping of the mouths. This is, without any doubt, a frequent cause of injuries to the tender mucosa, with consequent ulcerations and tumefaction of the submaxillary glands. Since I have given up this unnecessary torture of the little ones, which would correspond to the toilet of our own mouths with a stiff wire brush, I have seen hardly any cases of stomatitis or thrush or Bednar's aphthæ.

A few words about the books that are intended for the use of the young mother, such as those written by Holt, Kilmer, and others. These little books are of decided value and are a great help to us in our work, but why they should contain any formulæ, no matter how good, for the so-called artificial feeding of infants—and I must confess that most of these formulæ seem to me harmful in the light of our recent knowledge on this subject —is beyond my understanding. I need not tell you here about the difficulties of getting the right food for each individual newborn, and to leave this to mothers or nurses and to make these believe that it is easy and that all you have to have are a few utensils and a few printed formulæ for the different ages, is, I am sure, very bad advice.

One more point: By what right do registrars of vital statistics furnish the manufacturers of patent and proprietary foods with the names and addresses of the young mothers, so that they can send their booklets with the pictures of the "beautiful," fat, flabby, pale, rickety babies, who have survived feeding with their respective products, in which they tell that their foods are just like mother's milk and just as good and much less trouble to give? How much longer are we going to sit idly by and permit this indirect slaughter of the innocents?

In closing, I would like to suggest that the members of this Pediatric Section compile a booklet on the care of infants, which can with safety be put into the hands of young mothers and nurses, which would be based on our latest knowledge on this subject, and which should not contain any formulæ, or any other obsolete advice.

481 Franklin Street.

LEUKEMIA AFTER ANTITETANUS INJECTION.—E. J. Brown (*J. A. M. A.*, May 9, 1914) reports a case of acute lymphatic leukemia in a boy who four weeks before had been given a prophylactic dose of antitetanic serum. Two years previously he had taken a similar dose for a nail puncture of the foot.

A CASE OF ANOREXIA NERVOSA IN AN INFANT.*

BY NORRIS G. ORCHARD, M.D.,
Rochester, N. Y.

In going over the literature upon the various neuroses of childhood and infancy, one is impressed by two things—first, the tendency of some writers to lose themselves in the mazes of neuro-hystero-psychopathic theories, and, secondly, the scarcity of reports or discussions upon hysteria in infants.

The term *anorexia nervosa* is, of course, self-explanatory, but it would seem wise to restrict the use of the term. All gradations of the disease are to be found. Those varying from simple, almost insignificant, phases to those of extreme severity, terminating fatally.

No reference will be made to this condition so commonly found in young children, neither will the common perversions of appetite be considered. These latter have been well worked out and need have no place here.

A negative statement possibly best suggests the application of the term *anorexia nervosa*, that is, if we are able to find any organic lesion causing the condition we are not dealing with true anorexia nervosa. Forchheimer has expressed it as follows: "There must be absence of organic lesion which would explain the anorexia."

The condition in infants is extremely rare, to judge from the reports, and while nothing done in this case adds to our knowledge of the treatment, neither does it throw any light upon the etiology, yet it does seem worthy of report.

The consensus of opinion at present is that it is a neurosis, and while it is extremely interesting to attempt to grasp the underlying psychology, at the same time it must be confessed that there are too many unknowns in the equation.

Precocity on the part of the infant, or the presence of a very delicately balanced nervous organism in either parent, must not be disregarded as factors. To what extent they obtain as a suggesting force must be left undecided.

Forchheimer has reported several cases of anorexia nervosa in children with a review of the literature, and gives his ideas upon the etiology of the condition. His paper includes Friedlander's case, which was considered to be the youngest patient in whom this condition was found.

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* Read before the Pediatric Section of the New York State Medical Society, April 29, 1913.

Friedlander's patient was one year old. Attempts to wean the child brought about a complete refusal of food. Repeated thorough examinations were absolutely negative. He was removed to a hospital; and for four days nothing was taken by mouth despite all skilled effort. Saline solution was given by rectum. It was not until the end of the second week that the child began to take food, being sustained meanwhile by gavage.

The case to be reported cannot be classed as one of great severity, and it is not at all improbable that placing a nurse in charge, or transferring the patient to a hospital might not have materially modified the progress.

G. B., male, age eleven months, nine days. Third child.

Family History.—Two brothers, both of whom are alive and well. The older child being highly organized, and who, between the age of seven and nine years, required careful watching because of moderately severe anorexia.

Father and mother alive and well. The parents, while not neurotic, possess markedly nervous temperaments; the father more so than the mother. Nothing of importance in the history of either parent.

Past History.—Child born at full term, frank breech presentation after a pregnancy marked by severe and prolonged vomiting.

The infant came under my care at about six weeks of age, at which time he was artificially fed, this being advised by the obstetrician in charge. Breast feeding was deemed impracticable because of failure experienced with the other children.

The baby made good progress, excepting an occasional gastro-intestinal upset due to the fact that the mother, who cared for the child, considered herself competent to modify formulæ without seeking medical advice.

Shortly before the onset of the present illness the infant was getting whole milk, 8 ounces every four hours, with one night feeding. He was also getting orange and beef juice daily.

Present Illness.—At the beginning of the present illness the baby weighed 23 pounds, 14 ounces He had four teeth, and, excepting this deficiency, was apparently a normal infant. Stools normal. No vomiting. Sleeping well. Happy disposition. He occasionally left from ½ to 1 ounce in the bottle.

On February 11th the mother stated that because it had become necessary to use a new nipple the infant was extremely reluctant to take the bottle. No stress was laid upon this common incident, and she was advised to offer him his food in a glass, and that if he refused to take it it was to be removed and no further effort made to get him to take it until next feeding time. It seemed wise to advise offering the milk in a glass because it might obviate the trouble of weaning him from the bottle a month or two later. No attempt was to be made to compel him to take the milk. The mother, however, was instructed to make him take at least 10 ounces of watei in the twenty-four hours.

In the twenty-four hours of February 12th he took of milk, 7 ounces; water, 8 ounces. Part of the milk he took from a spoon, part from a glass. Water he took from a spoon.

February 13th. Took milk, 4 ounces; water, 9 ounces; beef juice, one teaspoonful.

February 13th. Took 16 ounces of water, but no milk.

At this period the mother in desperation, and with my consent, offered him milk from the bottle, using the old as well as new nipple. Great care was employed to remove the odor from the new nipple by frequent boiling and by manipulation it was given the consistency of used rubber. The infant not only evinced no desire for the milk, but with both hands would push the bottle away, and resented deeply any attempt to place the nipple between his lips.

Repeated careful examinations revealed absolutely no physical abnormality. Pulse was slightly increased in rate. No fever. Stools were scant and at times green, but not foul. No blood or mucus. Urine was negative, excepting a rather high specific gravity (1.039) and a slight increase in normal solids. Blood negative. No Wassermann was done. Reflexes normal throughout. No discernible change in mentality. As might be expected, no stigmata of hysteria obtained.

By this time, the fifth day of the disease, during which time the total intake was: milk, 11 ounces; water, 43 ounces; beef juice, 1 teaspoonful, the child had lost 2 pounds. Was very fretful, slept badly and showed plainly the ordeal through which he was passing. Saline solution was promptly expelled, even when given in amounts as small as ½ ounce.

Every known art to induce the infant to take nourishment was called into play. He was taken to the dining-room and offered food at meal times with the rest of the family. He was seated on the knee, while the parents with audible gusto and evident delight partook of their food. He was left alone in the nursery with food. He was left alone with the other children at their meal time. Nothing of which we knew was left undone to overcome his determination not to eat.

On the 16th, the weight had dropped to 21 pounds—a loss of 2 pounds, 14 ounces.

Counsel was called in, and gavage decided upon. It was felt that after four or five feedings with the tube the discomfort and annoyance would be sufficiently great to correct the trouble.

The tube was introduced without difficulty, and 4 ounces of an equal mixture of milk and water were given; four and one-half hours later 6 ounces of a like mixture. The strength was gradually increased until he was getting 8 ounces of whole milk every four hours. The morning of the 18th he took four or five teaspoonfuls of cereal. The morning of the 19th he nibbled at zwiebach. At noon six teaspoonfuls of beef juice, and in the afternoon took 2 ounces of milk from a glass. It is interesting to note that preparations for gavage excited only interest apparently on the part of the patient, no objection or displeasure being evinced until the actual introduction of the tube.

At the end of the fourth day of gavage it was considered advisable to discontinue this measure, and to attempt once more to starve the infant into feeding.

One and one-half spoonfuls of barley gruel jelly; a small piece of bread with about 3½ ounces of a food mixture constituted the food taken on the first day. On the second day he began to take fluids fairly well, and a day or two later solids were taken freely. By the end of the week he was taking all the food offered. Further history is unimportant, excepting that he has since gone through chicken-pox, parotitis and double otitis media.

To sum up the case briefly, we have a healthy infant, unencumbered by parental taint, manifesting a determination not to take food. So far as may be determined the sole cause was the substitution of a new nipple for an old one. A persistent refusal, with a resultant loss of nearly 3 pounds, to take any food offered in any manner.

Added to this the lack of any organic lesion which we could discover to explain the disease. Gavage lasting four days, followed by a gradual surrender on the part of the infant.

109 Plymouth Avenue, South.

CHONDRODYSTROPHIA FETALIS.*

BY JAMES K. YOUNG, M.D.,
Associate Professor Orthopedic Surgery, University of Pennsylvania.

CASE I.—Fannie C., aged three years, was brought to the Polyclinic Dispensary on account of bent legs, wrists and back, which her mother states she has had since birth. The head was large, the body long and the extremities very short and bent. The labor was normal, at full term; she was breast-fed for one and one-half years; this was the first child, and they had been married five years; no miscarriages, and both parents were twenty-six years old, born in Russia—they had lived in Philadelphia four years, where the child was born. The mother wore corsets five months during her pregnancy. She also had a fall from a trolley-car during the second month of pregnancy. The child is well nourished and the body is full size for the age. She cut her first tooth at six months; she has never been able to sit up and is unable to walk. There are no deformities in the family. All the extremities are deformed, and the disproportion between the long body and short extremities is very noticeable. The sternum is prominent, and she holds her head far back. Numerous X-rays were taken of this case.

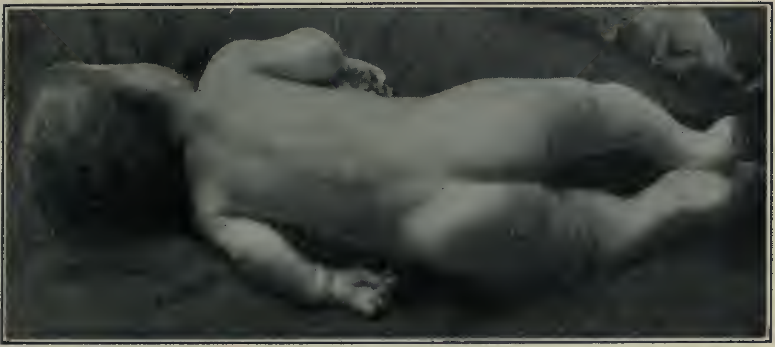

FIG. 1.—Case 1. Hyperplastic form, three years old.

CASE II.—The following case of chondrodystrophia fetalis in a female, two years old, was referred to me by Dr. Henry Lowenberg and Dr. Rose F. Robin, of the Jewish Maternity, to the latter of whom I am indebted for the notes of the child's birth. The duration of labor was about six hours, and not difficult. At the time of birth, a peculiar crepitation of all the extremities was felt; the extremities could be doubled upon themselves at parts where the crepitation was noticed. There was no edema of parts, but soon after swelling of thighs began. The head was very small; the sutures were smaller than usual. The X-ray was taken shortly after birth, and shows the position of the child very well. Its weight at birth was 5 pounds and 14 ounces. No measurements of the thorax were taken, but the ribs were very thin and the thorax had the consistency of a soft rubber ball. The spleen and liver were not enlarged. The heart action was very weak, but no murmurs were detected. The child was very much cyanosed at first; skin bluish tint and dry. A point of some importance was the fact that the placenta was bloodless and hard, due to calcareous degeneration. The parents were each thirty-five years old and healthy, and there was no his-

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* Read before the Philadelphia Pediatric Society, March 10, 1914.

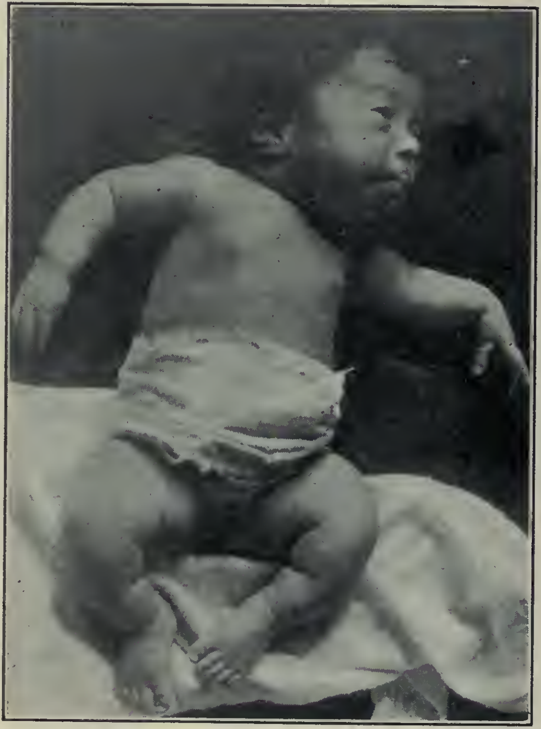

FIG. 2.—Case 2. Hypoplastic form, two weeks old.

tory of constitutional disease or rickets in the family; both parents were Russian Hebrews. There were six other children born, one of whom died at six months and one the day of birth. The four living children were aged fourteen, twelve, eight and five years, respectively, and all were strong and well. This was the first child born in this country, all the other children having been born in Russia. The mother stated that her living here was much the same as in Europe, but there was some menstrual irregularity which may have been due to change of climate or insufficient food. In Europe, her menstruation occurred every month, and lasted three days; in this country, it returned every six weeks and lasted seven or eight days. The mother does not know whether the child was premature. She had a severe fall one month before its birth, but did not notice any appreciable effect on fetus. There were enlargement of all the epiphyses, especially

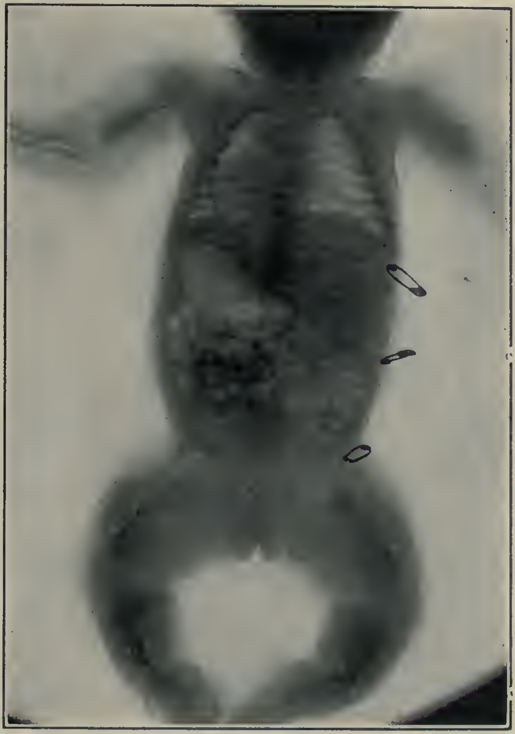

FIG. 3.—Case 2. X-Ray taken at birth.

the interior tibia, curvature of the long bone and twelve fractures. The clavicles, right humerus and both radii were fractured and had united; the left humerus, showing much callous, was ununited. The femura were curved outward, and showed a line of fracture in the middle third; the lower limbs presented marked angular curvature forward at the junction of the middle and lower third and were ununited. The ununited fractures proceeded to unite very quickly when fixed in splints, and in three weeks were all united. There was an umbilical hernia present. The illustration was made from a photograph taken on the fourteenth day of the child's life. The X-ray was taken on the first day of the infant's life.

The first case described represents the usual type of chondrodystrophia fetalis, such as is frequently confounded with rickets, but from which it may be distinguished by the X-ray findings.

The second case described is a fac-simile of one described by Rotch (*Pediatrics*, Fifth Edition, 1906, p. 331), except that the child reported by Rotch died on the ninth day after birth. This child was still living at the fourteenth week, when reported to the Society.

Chondrodystrophia fetalis, or fetal rickets, is a term used to describe a defect in the formation of the epiphyseal cartilage of the long bones in fetal life, resulting in a form of dwarfism. It is sometimes called achondroplasia. Several forms have been described—a hyperplastic chondrodystrophia, with excessive growth of the epiphyses, and hypoplastic chondrodystrophia, with irregular development of the epiphyses and sponginess of the bone, and chondrodystrophia malacia, characterized by softening of the epiphyseal cartilage. The most singular fact in connection with this condition is the occurrence of rickets in the same family after the birth of a child suffering from chondrodystrophia, as in the 2 cases illustrated by Whitman.*

The cause is unknown; it is only known that general malnutrition accompanies this condition and that the majority of patients so severely afflicted died soon after birth. All the changes in the bones are the result of a disturbance in the normal process of ossification.

Case I. represents the first form—hyperplastic. Case II. represents the second form—hypoplastic.

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* "Treatise on Orthopedic Surgery," Third Edition, 1907, p. 505.

SOCIETY REPORTS.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held March 12, 1914.

WILLIAM P. NORTHRUP, M.D., IN THE CHAIR.

PRESENTATION OF PATIENTS.

DR. JOHN J. MOORHEAD presented four patients out of a series of 8 cases of fracture of the femur treated by the transfixation method. Three of these children had been treated at the Harlem and one at the Post-Graduate Hospital. One of the patients had had a fracture of the femur and of the pelvis; the others had fractures of the femur only. Another of these patients had been treated with Buck's extension with the result that a great deal of soft callous was formed. Under anesthesia this was broken up by an open operation before the transfixation method was applied. This boy showed a little more shortening than the others. The shortening in the other 3 cases was from one-quarter to one-eighth of an inch. All of the patients had good knee function.

A CASE OF GUAIACOL POISONING BY ABSORPTION.

DR. LEWIS A. SEXTON, resident at the Willard Parker Hospital, read this paper, by invitation. (See p. 285, April number.)

DR. JOHN WINTERS BRANNAN said that during the reading of the paper the resemblance of this form of poisoning to the condition known as carboluria had suggested itself to him. In carboluria the urine was green. They used to see this when it was the practice to flush out abscesses with strong carbolic; it was due to the excretion of phenol in the urine and seemed to be quite similar to the condition described by Dr. Sexton.

TRANSFIXATION METHOD OF TREATMENT OF FRACTURED FEMUR IN CHILDREN.

DR. JOHN J. MOORHEAD in this paper pointed out the limitations of the operative method and of the various extension apparatus in the treatment of fractures. The various suspension methods might be used with advantage in children up to the age of three years, but after that age they were not likely to be satisfactory. The author's series of cases upon which his paper was based numbered eight children ranging in age from five to eight years. He had performed his first operation of this kind with a carpenter's bit and augur. He then devised a steel drill with a detachable cutting point. It was made of three-sixteenths-inch nickel steel. The method of procedure was as follows: After the child was anesthetized the location in the distal portion of the fractured bone chosen for transfixation was painted with iodin. The drill was then introduced through the soft tissue, the bone and the soft tissue on the opposite side until it reached the skin. It must not be permitted to enter the medullary canal, the joint, or the epiphyseal line and the fracture hematoma must be avoided. The cutting point was then detached and a simple contrivance attached to either end of the drill, to which in turn were attached the cords and weights. This method was applicable to fractures of the tibia, the humerus, and the femur, but it was particularly adapted to the latter. In fractures of the leg as much as 32 pounds could be applied. This procedure was applicable in cases in which other methods had failed, in overlapping fractures, comminuted fractures, old fractures, fractures of the condyle and in almost all fractures where ordinary methods could not be employed. It was preferable to plating because it was a much simpler and less extensive operation, requiring less time and less risk of infection; neither did it necessitate a secondary operation, as plating so often did. The patient was under anesthesia only fifteen minutes, and did not suffer pain during convalescence. Nursing was a simpler matter than with other methods, and above all the results in respect to function and deformity were much more satisfactory than by the other methods. There was rarely ever any shortening and in some instances there was lengthening.

THE PERIL OF DELAY IN THE DIAGNOSIS AND TREATMENT OF INTUSSUSCEPTION IN INFANCY.

Dr. Edward Wadsworth Peterson said that it had taken years of educational effort to place the treatment of appendicitis upon a purely surgical basis. To-day there was general condemnation if a patient with appendicitis was allowed to die without surgical interference. Acute intussusception was far more dangerous to life than appendicitis, and, theoretically at least, belonged exclusively to the surgical field. Experience taught one to recognize the hopelessness of expectant treatment and the relative futility of all aero-hydrostatic measures.

In intussusception the clinical picture was more constant and unvarying and the symptoms more uniform and characteristic than in any other type of intestinal obstruction. In spite of this no class of cases was more often unrecognized and more habitually mismanaged. Because of failure to make a diagnosis or delay in treatment, the mortality in this disease was also disgracefully high. It was unfortunate that hydrostatic pressure and gas or air inflation succeeded in a limited number of cases, for such measures were often persisted in until the time for a necessary operation had passed. Ladd had collected 216 cases treated by this method with failure in 81 per cent. Clubbe in 173 cases was able to reduce the invagination by enema in but sixteen instances. Leichenstern in a study of 557 cases of intussusception placed the mortality at 73 per cent. and during the first year of life at 88 per cent. Many other authorities gave equally unfavorable results with these methods of treatment. The fault rarely rested with the family in refusing operation, but with the physician who failed to realize his responsibility in the care of this peculiarly serious affection. The statistics of greatest interest were those giving the time of treatment, either surgical or otherwise, after the onset of symptoms, and almost invariably one was impressed with the fact that "cured" cases were diagnosed and treated early. Cases recognized and treated during the first twenty-four hours gave a mortality, in experienced hands, of not over 10 per cent. Cases treated after two days had passed with but few exceptions had but little chance of recovery. Clubbe's work was an inspiration to every pediatric surgeon. Of the 173 cases which he treated, 16 were successfully reduced by enema. Of the remaining 157 cases operated upon the results were as follows: In the first 50 cases there were 25 deaths and 25 recoveries; in the second 50 cases, there were 12 deaths and 38 recoveries, while in the third series of 50 cases there were 4 deaths and 46 recoveries, a mortality of 8 per cent. In the last 25 cases treated by laparotomy there was not a single death. The secret of his remarkable success was early diagnosis and prompt surgical treatment. In his last 50 cases the average time from the onset of the symptoms until operation was but seventeen hours. In the majority of cases, after forty-eight hours, the invagination was either irreducible or gangrenous, and resection or enterostomy was required, with either of which procedures the mortality was frightfully high. A search of the literature revealed but eight successful resections in infancy.

In a study of this disease the most striking point was the wide difference between the mortality in the early and the late operations. Probably 70 per cent. of all cases of intussusception occurred during the first year of life.

No other serious surgical affection of the abdomen could be so early recognized. The first examination of the infant generally revealed the condition, and at such a time disinvagination was a simple matter. Generally speaking, the child was seized suddenly with severe abdominal pain, more or less pallor, shock, and relaxation. Vomiting usually occurred at this time. Later there was straining and blood and mucus appeared in the stools. With this typical picture there was but one other symptom necessary to determine the diagnosis, namely, the presence of abdominal tumor.

After the first storm of pain was over, there followed a period of calm, during which the infant appeared perfectly well. Later the pain returned and was of an intermittent paroxysmal nature, accompanied by straining, but not by the pallor and shock which ushered in the initial seizure. If the patient was seen during the calm period, unless the history was carefully considered, the diagnosis was apt to be overlooked. Muco-hemorrhagic stools commenced in from two to twelve hours after the onset of the disease; after the first movement or two the stools contained bile or feces, and flatus was not passed. Vomiting was rarely a prominent symptom until late in the disease; where it occurred early and was persistent it was significant of strangulation of the blood supply to the bowel. Rarely was it fecal. In every case of intussusception there was present an abdominal tumor, but it was often difficult to palpate. The typical sausage-shaped tumor of the text-books had been too much emphasized. It was rarely felt early and when present meant that the intussusception had progressed to a considerable extent. More often a rounded mass was felt and it might occupy any portion of the abdomen. It was generally quite movable and might resemble an enlarged gland. Where the tumor was oblong or sausage-shaped it was curved, with the concavity directed toward the umbilicus. The mass might be felt to relax or contract under the hand. If the tumor could not be felt abdominally, then bi-manual rectal examination should be made. Under anesthesia one seldom failed to discover its presence. Later, in addition to obstruction and strangulation, toxemia developed as a result of injury to the bowel wall, particularly the mucosa, and from decomposition of the intestinal fluids. The late picture was that which occurred in every variety of intestinal obstruction. Ileocolitis and the purpuric diseases had occasionally been mistaken for intussusception In the former there was fever and diarrhea with mucus and blood, and bile, feces and flatus were passed. No abdominal tumor was present. The purpuric diseases were rare in infancy and hemorrhages elsewhere than from the intestine gave the clue to the diagnosis. It must not be forgotten that intussusception might develop as a complication of these diseases.

The simplest, most successful, and only certain method of treatment in intussusception was early laparotomy with manual reduction of the invagination. Spontaneous reduction had been known to take place and cases had recovered after sloughing of the intussusception. Such results, however, must never be expected or awaited. Like strangulated hernia or fulminating appendicitis it was a condition demanding immediate operative interference. The operation should be performed as quickly as was consistent with safe and thorough work, for infants did not stand prolonged operation well. As three-fourths of the cases originated in the ileocecal region, the incision should be made through the outer margin of the right rectus muscle. Some operators preferred the median incision where the tumor was felt low down on the left side. In relieving the intussusception it was best to commence at the apex of the intussusception and carefully back up to the point where the invagination started. If traction was made on the proximal portion the gut was apt to be torn at the neck of the intussusception. If gangrene had occurred, or if reduction was impossible, resection and intestinal anastomosis should be performed. In all early operations it was a good plan where the invagination occurred in the ileocecal region to remove the appendix, for it might in certain instances be a causative factor in the production of the obstruction. In closing the wound one should reinforce the layer sutures of catgut with through and through tension sutures, as the abdominal wall was subjected to considerable strain.

Dr. Leon T. LeWald said that through the kindness of Dr. Gould he had seen a case of intussusception in a male child sixteen months of age. The child was taken suddenly ill one morning and by noon was considerably worse; at 4 p.m. he vomited. The following morning Dr. Gould had asked him to confirm a diagnosis of intussusception, and asked whether he thought it was dangerous to administer bismuth for the purpose of getting an X-ray. Dr. LeWald said he replied that it was his belief that there was a wrong impression as to the danger of administering bismuth in such cases; there was no danger, provided the bismuth was administered carefully and in moderate amounts.

The child was taken to the hospital and 75 grams of bismuth in 250 c.c. of suspension medium was given, and inside of thirteen minutes they had the X-ray and had confirmed the diagnosis and located the exact site of the intussusception. The child was taken to the operating room immediately and a successful operation performed; the intussusception was found in the ileocecal region just where the X-ray had indicated. The ileum had travelled all the way back to the cecum and could be outlined by gas in the invaginated portion of the gut.

Dr. LeWald said that this was the second case of this kind diagnosed by bismuth and the X-ray, the first having been presented at the Medical Society of the State of New York last year. In Dr. Gould's case the tumor could not be felt even under anesthesia.

Dr. H. H. M. Lyle said that Dr. Peterson had given them a most able presentation and had impressed upon them the importance of early diagnosis in cases of intussusception in children. Early diagnosis was the keynote of surgical success.

Dr. Peterson claimed to have reported the first case recorded in the literature. Dr. Lyle had not made a study of the literature but knew of four instances in which resection had been performed in children, one of them being in 1901. None of the patients were over three years of age and one was an infant only a few days old.

In regard to the danger of administering bismuth, Dr. Lyle said he thought one should be guarded in making statements regarding the harmlessness of this procedure. The result of administering bismuth in the face of intestinal obstruction was apt to be serious and fatalities had been recorded. One should consider very carefully the advisability, when confronted with the toxemia attendant on intestinal obstruction, of adding another element to an already serious condition. Dr. Lyle had been called in to operate on a case of acute intestinal obstruction which arose as the result of bismuth X-ray examination. One must remember that the condition in an obstructed bowel was quite different from a normal one, and that bismuth poisoning might occur. This had happened with fatal result.

Dr. Everett W. Gould said, in reference to the case which Dr. LeWald reported, that the clinical symptoms had been sufficient to make a fairly definite diagnosis, but that the X-ray examination which was made while Dr. Walton Martin was preparing for the operation clinched the diagnosis and definitely located the lesion. The ileum had invaginated the cecum not more than three or four inches, further invagination having been prevented by an old adhesion. The child made a good recovery. No resection was necessary.

Dr. Northrup asked Dr. Gould whether he could feel the tumor.

Dr. Gould replied that when he examined the child the previous evening he thought he felt a very slight resistance in the right iliac fossa, but the following morning he was unable to make out any tumor, and after the anesthetic had been administered Dr. Martin was unable to make out any definite tumor.

Dr. J. Finley Bell, of Englewood, N. J., said he thought the general practitioner found himself in something of a quandary when confronted with the apparent danger of an operation in a young child as compared with the introduction of air and water, which seemed so much less formidable a procedure. Many physicians were laboring under a false impression as to the ability of young children to stand operative measures. This impression was probably strengthened by the fact that in cases in which operation seemed advisable it was delayed while consultations and manipulations consumed time until when the child actually came to operation it was in no condition to withstand the ordeal. With early diagnosis and early operation it would probably be found that children bore operative measures much better than had been supposed.

Dr. John C. A. Gerster disagreed with what Dr. Peterson had said regarding the use of the right rectus incision. He said there was no question but that the median incision offered the most advantages. As has been said, the intussusception might be in any part of the abdomen and the median incision gave readiest access to all parts of the abdomen with least trauma.

Dr. Gerster said that time was an important element and hence removal of the appendix, unless it was gangrenous, had better be left for a second operation in which speed was not such a vital necessity.

Dr. William P. Northrup said he had the misfortune many years ago to report 2 favorable cases of intussusception which had occurred in the practice of Louis K. Neff as having been cured by the introduction of water. He had since considered this a great mistake and had been trying to make amends. The first patient had been brought to the office in the morning to consult in regard to vaccination. At two in the afternoon Dr. Neff was sent for and found the child in great pain. By six in the evening the diagnosis of intussusception had been made and water was introduced. Dr. Northrup said he had assisted on this occasion and under the pressure of the water one could feel the invagination give way. The child made a good recovery.

A second case almost identical with this came under their observation a week later. Here, too, under the same treatment the child recovered.

These 2 cases illustrated everything brought out by Dr. Peterson, the acute stage of crying, severe pain and pallor, followed by a period of quiescence and relaxation, and then the recurrence of severe symptoms. One could pick up the sausage-shaped tumor and could feel it disappear under the pressure of the water.

Dr. Northrup said he had tried to undo the mischief he might have occasioned by reporting those cases. Dr. Bell had struck the right note in what he had said regarding procrastination, and that by the time the decision was made the child could not stand the operation. Speaking of the shock of operation, it had been shown that in a child a few weeks old a gastroenterostomy could be done successfully.

THE PREVENTION OF GROSS DEFORMITIES IN POTT'S DISEASE.

Dr. Percy Willard Roberts gave a lantern slide exhibit demonstrating his method of treating Pott's disease and the results obtained thereby. This method had been advocated three or four years ago and seemed to be of real value in preventing gross deformities. The speaker showed slides illustrating cases inefficiently treated by plaster jackets and vertical suspension, and one untreated case which could have been cured by proper treatment. Dr. Roberts stated that the method which he presented was most useful in treating deformities below the eighth dorsal vertebra, and that his talk related to lesions below that point. These deformities might occur in any part of the spinal column, and their production occurred usually in three stages. The first consisted in the softening of the bone by the tuberculous process; the second, friction in rotation; and third, the collapse resulting in deformity. The treatment of Pott's disease theoretically was to put the bones at rest and thus protect them against friction in rotation. To carry out this theory the routine treatment had been by braces and plaster jackets. The Sayre jacket and the Taylor brace had been devised fifty years ago and while they had been modified they had not been improved upon until recently. One could place reliance on these devices together with the chin brace in deformities in the high dorsal and cervical regions. The Sayre jacket immobilized perfectly and it appeared to accomplish the point desired, namely, immobilization of the spine and relief from weight. The vertebrae were separated somewhat and the patient received relief, but when he got on his feet again the body sagged or telescoped and permitted pressure at the point of deformity, and there was again a little erosion necessitating a new jacket and thus it went from jacket to jacket. This was not always the case, but when it did occur the results were deformities such as had been shown. When there was any considerable deformity the upright suspension did not overcome it. In order to accomplish the requisite hyperextension in the correction of a deformity due to Pott's disease, Dr. Roberts had devised a simple apparatus consisting of an ordinary automobile jack to which was attached a horizontal bar. From the bar was suspended a sling which was passed around the patient's body at the point of the deformity and the hyperextension thus effected. While the patient was in this position the plaster jacket was applied. This method was particularly effective in correcting slight deformities and preventing gross ones. Its application was also very simple, one person being able to put on a jacket alone, where a number of assistants would be required by the suspension method. When the plaster was applied with the patient in the hyperextension position there was not the same tendency to telescope that had been observed with other methods.

The speaker showed a number of slides illustrating the method of applying the sling, showing the gap between the vertebrae and the results of the treatment. There was extreme lordosis in some instances, but Dr. Roberts believed this would not be maintained. In the cases treated early there was very little deformity. The tracings shown demonstrated that there was a reduction or a recession of the deformity in nearly all cases treated in this way. The same point might be made that was made by Dr. Peterson in reference to intussusception and that was true in other fields, namely, that the cases that came to treatment early did better than those treated later in the course of the disease. With this method of treatment the symptoms disappeared earlier, there were fewer abscesses developed, and the patient's comfort was enhanced during the application of the jacket and during the time of treatment.

Dr. H. H. M. Lyle said that Dr. Moorhead's cases spoke for themselves. Fractures of the femur in which there was overriding gave considerable trouble and the ordinary extension methods often failed to overcome the deformity. In the Steinman extension method we had a valuable means which could be regarded as conservative when compared with open operation, plating, etc. The method was indicated in old fractures. The writer had shown such a case at the last meeting of the Surgical Society and the one presented by Dr. Moorhead was a splendid example of the possibilities of the method. It was indicated in certain cases of mal-union and was the method of choice in all severe compound fractures. The method was simple, quickly performed, and the patient was strikingly comfortable. In inserting the pin four cardinal points were to be observed. The fracture hematoma must be avoided, the pin must not enter the medullary canal, the joint, or the epiphyseal line.

Dr. John C. A. Gerster said that up to the present time his experience with fractures of the femur comprised 30 cases, 11 of which were in children ranging from four to fifteen years of age. He did not agree with Dr. Moorhead about certain minor points of technique. The sharp-pointed nail bored through the bone without any difficulty, so that a rod carrying a detachable drill was an unnecessary refinement. A preliminary incision was also not necessary; it had been tried in Germany and given up. Steinman used the nail as a drill fixed in a brace. The pin was simply a bit of steel rod, pointed at the end.

Dr. Moorhead said that the anesthetic lasted only fifteen minutes. Dr. Gerster used nitrous oxide anesthesia during only the three to five minutes required actually to transfix the limb. Infection need not be expected with this method if the proper asepsis was maintained. Pain and discomfort were less than with an efficient Buck's extension. Nursing also was easier than with a Buck's extension; the child could raise the hips clear of the bed without the slightest pain. In the presence of contusions or abrasions about the knee, one could safely wait a week or ten days without fear of getting a bad result. In neglected fractures of some weeks' standing, nail extension was extremely valuable.

In mal-union with much shortening brilliant results had followed exposure and separation of the mal-united fragments with simple closure of the wound and application of nail extension. Naturally more weight was required than in recent cases. The chances of union were much better with nail extension than with Lane plating, because in the former none of the osteogenetic tissue was removed; besides in nail extension, massage and passive motion might be begun as early as the fifth day, as was mentioned by Dr. Moorhead.

Dr. Henry Ling Taylor said he was very much interested in the cases shown and the results were most admirable. He had been particularly interested in the positive manner in which Dr.

Moorhead had condemned plating as a routine measure. Personally he believed that the introduction of plating had done much harm because the man practising in small towns was led to use this method and might keep it up long after the man with greater experience had seen the bad results and given it up. Plating was really valuable in only a few cases, while there were many cases that had gone wrong through this procedure.

There were one or two methods of treating fractures of the femur which were not mentioned by the reader of the paper. One was Van Arsdale's triangular splint to hold the thigh in the flexed position; this was applicable to fractures in the upper half of the femur, and the same result could be obtained by flexing the leg, reducing the deformity, and putting it in a plaster spica in that position. This was done quite frequently in babies at the Hospital for the Ruptured and Crippled and gave good results. The other method was by the use of Hawley's table, which was marvellously efficient in fracture cases, and by it the deformity could be reduced in early cases and a plaster splint could be applied without moving the patient.

Dr. Taylor said he was interested in Dr. Roberts' work as well as in the operative method of treating Pott's disease. The basic principle for treating Pott's disease had been laid down fifty years ago by Taylor and Sayre, and there had been no better methods suggested until within the past few years. During all those years the subject had remained *in statu quo*. Their principles were correct, namely, to put the part at rest in the best possible posture. Better results were obtained in private practice than in clinic work, though many cases did well in clinics. He recalled a case of a girl who had been treated by C. F. Taylor from 1871 to 1879 and cured, with recession of the deformity. She returned in 1909, thirty years after her cure, and having been married and had children, she had no deformity. This showed what was possible in favorable cases, but all cases were not so favorable, even in private practice. The brace treatment required a long time, though it was not necessarily irksome to the child or the parent as the pain and discomfort of the patient were promptly relieved and the general condition of the patient improved, but it was necessary to wear a brace for many years, and in even these cases the result was often mediocre. Other cases did well and had good backs at the end of three or four years.

Some years ago the profession had Callot's disease (Dr. Taylor said he used the word "disease" advisedly), Callot being then young and inexperienced believed that all one had to do to correct kyphosis was to use great force. His own expression was "*avec toutes mes forces*—I straighten the kyphosis." The method presented this evening was a rational Callot's; Dr. Roberts applied a gentle force and one that was controlled, and undoubtedly this was a step in advance. One should bear in mind, however, that a case might be over-corrected and too much force should not be applied. Dr. Taylor heartily endorsed this method if it was used with discretion.

CAUSE OF ACUTE ANTERIOR POLIOMYELITIS.—Lust and Rosenberg (*Münch. Med. Woch.*, January 20 and 27, 1914) have studied this subject very extensively upon fowls and conclude that fowls are not sensitive to the virus of this affection as found in men and apes, whether exposure is natural or artificial. The occasional occurrence of a paralyzed chicken in the neighborhood of an epidemic of acute poliomyelitis is not sufficient to identify the disease in fowls with that in man, so that anatomical and histological studies must be made in the diseased fowl. The latter have revealed various abnormal conditions in the fowl's spinal cord, as might have been expected; but acute poliomyelitis as seen in man and apes is not included. Nevertheless, but a few chickens have thus far been examined in this respect. But even if the histological finds are ever found to be the same, the failure of the virus to take still will furnish an obstacle to identity. Fowl paralysis is not the only disease of fowls which attacks the nervous centers. In fact, if we take the domestic animals as a class, centers are involved in a number of severe affections—Borna's disease in horses, the dog plague and rabies canina, guinea-pig paralysis, and perhaps the fowl pestilence—are all evidently due to an ultrafilterable virus, and all prevail in the form of epidemic diseases, just as does acute poliomyelitis in man.—*Medical Record.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

March 10, 1914.

W. N. Bradley, M.D., President.

CHONDRODYSTROPHIA FETALIS.

Dr. J. K. Young showed 2 interesting cases. The first was a boy of three years, presenting typical symptoms of a large body with short extremities, as commonly seen in this affection. All extremities were markedly curved, the epiphyses were greatly enlarged and the child could not sit up or walk. The second case was a baby of fourteen weeks, which presented at birth the long body and short extremities. The extremities were greatly deformed and there were 12 fractures, some united and some un-united. The parents of both children were Russians. There was a history of malnutrition. The cause of the condition was not known. (See p. 371.)

CONGENITAL HEART DISEASE.

Dr. Alice Weld Tallant showed a baby born three weeks before, at the Maternity of the Woman's Medical College of Pennsylvania. He is the ninth child of a German woman forty-one years old; the others are living and well. Labor was normal and easy, and the baby showed no asphyxiation at birth. By the next morning cyanosis was apparent, growing deeper when the child cried. Examination showed the heart enlarged a finger's breadth to the right of the sternum, very loud, vigorous beats, with galiop rhythm at times when the child was held upright. There was neither thrill nor murmur. The child nurses well but has rapidly lost in weight, from 7 pounds to less than 6½, where it now stays. Temperature has been continuously subnormal, falling even below 96°. The blood count, 6,020,000 red cells, shows the polycythemia characteristic of congenital heart lesions; hemoglobin is 85 per cent. The diagnosis must remain uncertain. In the absence of a murmur, patent foramen ovale or other septum defect is possible. For the beautiful X-ray picture of the child, Dr. Tallant is indebted to Dr. Gisela von Poswik.

HYDROCEPHALUS.

Dr. W. E. Dandy, of Johns Hopkins Hospital, by invitation, showed lantern slides, telling of their experimental work upon hydrocephalus.

Dr. Dandy said, although clinically subdivided into groups, such as internal and external, chronic and acute, congenital and acquired, internal hydrocephalus is still an idiopathic disease. They have undertaken a study to determine the fundamental factors underlying the normal cerebrospinal fluid, the place and method of formation and absorption; and have produced it experimentally and finally have correlated these findings with the clinical and pathological study of the disease. They have been able to produce an internal hydrocephalus by placing an obstruction in the aqueduct of Sylvius. This is done by passing a small piece of cotton on the end of a carrier along the floor of the fourth ventricle into the aqueduct, where it is deposited. When a silver clip is placed on the vein of Galen, an internal hydrocephalus may result, but it is only when the occlusion is near the origin of this vein. When placed distally on the vein, there are no results. By the use of phenolsulphonephthalein they have been able to show that this substance can be found in the urine in five minutes, and 30 to 40 per cent. is excreted in two hours. A new supply of cerebrospinal fluid, therefore, is formed and absorbed at least three or four times in twenty-four hours. The absorption of cerebrospinal fluid is directly into the blood, and the lymph plays practically no part. It passes by a diffuse process from the entire subarachnoid space, and is not limited to the Pacchionian granulations, and there are no specialized structures, as stomata, for its passage. There is no absorption of cerebrospinal fluid from the ventricles, the entire absorption taking place from the subarachnoid space. It is therefore obvious that fluid forming in the ventricles must require the foramina of Magendie and Luschka, the existence of which has been questioned. In the cases of hydrocephalus in which these foramena are occluded, there is no transmission of phenolsulphonephthalein from the ventricles to the subarachnoid space. If hydrocephalus does not exist, fluid rapidly passes from the ventricles to the subarachnoid space, functionally demonstrating the presence of these openings.

Dr. Dandy said that the participation of the ependyma in the production of hydrocephalus has been left an open question. The cerebrospinal fluid can pass out of the ventricles only when there is no obstruction. The Anton method of puncturing the corpus callosum has never given good results.

Dr. K. D. Blackfan, of Johns Hopkins Hospital, by invitation, discussed a clinical and pathological consideration of hydrocephalus.

On the basis of experimental investigation conducted by Drs. Dandy and Blackfan, internal hydrocephalus has been studied to determine (1) the absorption of cerebrospinal fluid from the ventricles; (2) from the subarachnoid space; (3) whether or not there is a communication between the ventricles and the subarachnoid space, and (4) these observations were correlated with the pathological findings. A specially prepared neutral solution of phenolsulphonephthalein was used. One c.c. (6 mgs.) was diluted with two to three c.c. of freshly-obtained cerebrospinal fluid and injected into the ventricle. The time of its first appearance in the urine and the amount excreted over a two-hour period were estimated. The same procedure was employed in the subarachnoid space. The communication was demonstrated by determining phenolsulphonephthalein in the spinal fluid from the lumbar subarachnoid space, after its intraventricular injection. A normal standard of absorption from the ventricles and the subarachnoid space was determined from patients without hydrocephalus. In such patients phenolsulphonephthalein appeared in the spinal fluid of the lumbar subarachnoid space after its intraventricular injection in one to seven minutes. By demonstrating the patency or occlusion of the communication between the ventricles and the subarachnoid space, it was possible to subdivide the cases of internal hydrocephalus into two groups, obstructive and communicating. Seven cases of the obstructive type were studied. In each there was an obstruction, as shown by the non-appearance of phenolsulphonephthalein in the spinal fluid after its injection into the ventricle. In 5 an obstruction was demonstrated at autopsy; the other 2 patients are still alive. The ventricular absorption was negligible in this group (¼ to 1 per cent.) as compared to the normal (10 to 20 per cent. in two hours.) This is evidence that there is practically no absorption from the ventricles. The time of first appearance of phenolsulphonephthalein in the urine was much delayed (thirty to forty-five minutes, as compared to the normal seven to ten minutes). The subarachnoid absorption was normal, as shown by the excretion of 35 to 60 per cent. in a period of two hours. The essential feature in this type of hydrocephalus was the obstruction to the normal passage of cerebrospinal fluid from the ventricle to the subarachnoid space. When such obstruction exists, hydrocephalus results because the cerebrospinal fluid cannot escape from its place of origin in the ventricle, where absorption is negligible, to the subarachnoid space, where the absorption is high and takes place normally.

Five cases of the communicating type were studied. In each free communication between the ventricles and the subarachnoid space was demonstrated by the phenolsulphonephthalein test. This communication was further attested by the appearance of the solution in the ventricular fluid after its injection into the lumbar subarachnoid space. This transmission of fluid to the ventricles after lumbar injection is of the utmost importance in the consideration of the treatment of disease of the central nervous system by intraspinal medication. The absorption from the subarachnoid space was greatly diminished (10 to 20 per cent. as compared to the normal 35 to 60 per cent.) The time of first appearance in the urine was correspondingly longer. This diminished absorption was constant and is the physiopathological basis for the development of this type of internal hydrocephalus. The ventricular absorption (2 to 6 per cent.) though low, was definitely higher than in the obstructive type. Since it has been shown that there is practically no direct absorption from the ventricles, the absorption from the ventricles in this type and in normal individuals must be dependent upon the absorption from the subarachnoid space. No pathological examination was obtained in cases of this type. The essential feature is the low absorption of cerebrospinal fluid from the subarachnoid space. In the obstructive type an obstruction was found in 5 of the 7 cases. In 2 cases this was due to adhesions obliterating the foramina of exit at the base of the brain; in 1 to a tuberculous exudate at the base of the brain; and in 2 there was a congenital absence of the aqueduct of Sylvius. There was a definite history of meningitis preceding the onset of hydrocephalus in 2 cases of the communicating group. The hydrocephalus in one case of the obstructive group was preceded by epidemic cerebrospinal meningitis, and in another, in which hydrocephalus was present at birth, there were old adhesions. These probably resulted from prenatal infection of meningitis. One case of hydrocephalus resulting after removal of a cervical meningocele was studied. There was diminished absorption from the subarachnoid space in this case. This low absorption may have been the reason for the development of hydrocephalus following the removal of the meningocele. These observations show that there are two anatomically different types of hydrocephalus. In the one the treatment should be directed toward removal of the obstruction; in the other, a means for increasing the absorption of cerebrospinal fluid should be supplied.

Dr. Max M. Peet said that Dr. Frazier and he had been doing practically the same work here. In their experiments upon dogs they have used a slightly different technique, the posterior end of the fourth ventricle being exposed by an incision through the occipito-atlanto ligaments, instead of by a double occipital decompression. They had used gauze instead of cotton, within the fourth ventricle, causing blockage of the aqueduct of Sylvius. Aleuronat had also been used and, when combined with the gauze plug, produced a rapidly fatal hydrocephalus in animals. They also succeeded in obtaining hydrocephalus in puppies. Hydrocephalus had resulted in one dog in which the pineal gland had been removed, probably due to adhesions on the floor of the third ventricle. Phenolsulphonephthalein had been used as the indicator of absorption of cerebrospinal fluid. Trypan red and trypan blue had also been used, and demonstrated that the stain was very slowly taken up by the lymphatics, passing out of the skull through the nerve sheaths, principally the optic and olfactory, staining the posterior nasal fossa from which it was taken up and carried down the anterior lymphatics of the neck. Their work did not sustain some of the statements of Kopetzky and Haynes. No drugs have been found which increased the cerebrospinal fluid. Colloidin tubes drained the ventricles well in their experiment. He considered that their work confirmed that which had been reported by Dandy and Blackfan.

Dr. W. G. Spiller considered this work most important. When the aqueduct of Sylvius is occluded, the fourth ventricle usually is not dilated. The rapid increase of cerebrospinal fluid under certain conditions is most striking. There must be a communication between the ventricles and the subarachnoid space. The X-rays will show hydrocephalus by atrophy of the inner table of the skull, corresponding to the cerebral convolutions. He has found that the head is not usually so large in the obstructive as in the non-obstructive hydrocephalus. Puncture of the corpus callosum is useless in the non-obstructive cases. He asked how the phenolsulphonephthalein is injected; also how the obstruction, when it exists elsewhere than in the roof of the fourth ventricle, is to be removed. Dr. Spiller then referred to the various types of hydrocephalus which he had studied, and finally asked how they would treat the non-obstructive type of hydrocephalus. As far as he knew, the results of treatment had not been brilliant.

Dr. W. S. Cornell spoke of the part possibly played by the ependyma in the production of hydrocephalus and the possibility of a seepage or lymph circulation from the ventricles outward through the brain substances to the subarachnoid space. The theory that hydrocephalus may often be due to a latent ependymitis is not new. The experiment just mentioned in which an irritating chemical substance injected into the ventricles had produced rapid hydrocephalus and death was certainly not antagonistic to this view.

Dr. A. Gordon thought that the test devised by Drs. Dandy and Blackfan was of paramount importance, since in the obstructive type only surgical intervention can bring relief. He referred to the procedures devised by Anton and Brennan, Krause and Finkelstein. He also referred to a recent case of hydrocephalus, due to internal non-hemorrhagic pachymeningitis. He kept this child alive by repeated punctures, 24 in all. He considered permanent drainage of the cisterna magna indicated in such cases.

Dr. D. J. McCarthy called attention to the fact that other conditions than those so far discussed can produce hydrocephalus. It might be due to developmental defects; prenatal conditions producing destruction; tuberculosis, etc. There is also Quincke's type of hydrocephalus. These conditions are neither obstructive nor non-obstructive. He also referred to experiments with injection of irritants, which he had performed some years ago, but had come to no definite conclusions.

Dr. Blackfan, in closing the discussion, said that the technique of a ventricular puncture was not difficult in the advanced cases, as fluid may be obtained by puncture at almost any point through the anterior fontanel. In the less dilated ventricles the puncture is made at the midpoint of the anterior fontanel about ½ cm. to the left or right of the middle. The needle is inserted about 2 to 4 cm. An ordinary lumbar puncture needle

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Casein-fat Milk as Food in Disease and Health.—P. Heim and M. K. John (*Monats. f. Kinderhk.,* Bd. XI., Nr. 12, 1913) fed 45 healthy children, beginning between the end of the second week of life and the fourth week, with casein-fat milk and continuing to the end of the seventh month. The children were at the end of that time all in good condition; the color, sleep, appetite, absence of dyspeptic processes, activity, motility, and all the bodily functions remained normal. The skin and mucous membranes were normal, in contrast to the eczematous conditions frequently observed in children fed on cow's milk. The milk is prepared by heating to 40°C. with a coffee-spoonful of labessence, causing a complete coagulation. The curd is then thoroughly broken up by stirring, when the cheese is pressed through a fine hair sieve, allowing the whey to run out. The remaining curd is mixed with two-thirds as much warm water and pressed through the sieve. An almost homogeneous fluid remains. This is placed on the fire to boil for three minutes. Then one-third hot cow's milk is added and 30 grams of Sohxlet sugar, and the mixture is put in a cool place. When this milk is given to young healthy children their nourishment is perfect, and when given to dyspeptic children the good effects are very soon apparent. The stools become fewer, consistency and color normal, body weight begins to increase and diuresis is apparent. The number of feedings can be reduced. Increase in weight, and in growth in length, ossification of the bones, and function of the bodily organs are all found to be normal under this feeding. If constipation is caused it can be combated by the use of milk sugar. The effect of this food on dyspepsia is seen in twenty-four hours. The food agrees with very young infants, in whom cow's milk causes dyspepsia.

CURRENT LITERATURE.

Abstracts in this Number by
Dr. Harold R. Mixsell. Dr. Mark S. Reuben.
Dr. S. W. Thurber.

DISEASES OF THE EAR, NOSE AND THROAT.

Braislin, William C.: The Use of Vaccines after the Mastoid Operation. (*Annals of Otology, Rhinology and Laryngology,* December, 1913, p. 1,085.)

Vaccines were employed in 6 cases out of a total of 35 for the following complications:—

(1) Extensive cervical adenitis following streptococcus mastoiditis and cervical abscess.

(2) Obscure elevation of temperature following the mastoid operation, the lateral sinus being excluded, as the cause.

(3) Delay in healing.

(4) Pain in limbs and joints following streptococcus mastoiditis with operation.

(5) Case of postoperative pneumonia.

(6) Case of labyrinthine infection.

In the first case, a girl of two and a half years, a stock antistreptococcus vaccine was used, giving one minim daily for four days and then increasing the interval. The glandular swelling began to decline in twenty-four hours and healing went on rapidly.

In the second case, girl of three, double mastoid operation following measles. Unexplained high temperature rapidly brought down by the use of an autogenous vaccine.

In a third case, girl of fourteen, operated on for mastoiditis following tonsillitis, the use of an autogenous vaccine was of benefit in a prolonged convalescence attended with much pain in joints and limbs.

In a fourth case, that of a poorly nourished infant of nine months with a double mastoiditis, following the operations a polyvalent vaccine was administered every fourth day for four weeks, but the child died and both lungs were found extensively consolidated. This was the only fatal case in the series.

S. W. Thurber.

MEDICINE.

GLAZE, E. L., ATHENS, ALA.: SYPHILIS DIAGNOSED AS DIPHTHERIA. (*Journal of American Medical Association,* March 28.)

Glaze reports a case of syphilitic sore throat seen while diphtheria cases were in the community and giving rise to a white membrane in the throat, diagnosed as diphtheria. Antidiphtheritic treatment was employed and the eruption that followed was attributed to the antitoxin; the result was a specially malignant case of syphilis. The case is reported on account of the mistake in diagnosis and in not promptly revealing the true nature of the disease in time. It also shows the importance of more thorough examination of all cases.

MCCLEARE, THOMAS C., M.D., BERKELEY, CAL.: ACUTE ACID INTOXICATION IN CHILDREN. (*Journal of American Medical Association,* November 15, 1913.)

A resumé of our present knowledge about a recurrent symptom-complex occurring in children from two to ten, in which acidosis is a marked and constant characteristic. The onset may be sudden or may be preceded by prodromes of listlessness, anorexia, coated tongue, a pale bluish ring around the mouth and under the eyes, and dusky cheeks. There is usually headache, coryza, injected conjunctivæ, and a variable cough. Apathy, or even coma, is common and is generally preceded by intense nervousness or meningismus. The child looks ill, the face being pinched and pale or even cyanotic, with sunken and dull eyes. The lips are dry and cracked, there are sordes on the teeth, and the tongue is dry and brown with strawberry edges. The skin is dry and harsh, the abdomen is retracted and there are signs of general wasting. On the breath there can be detected the sweetish, fruity odor of acetone. Fever rarely exceeds 103°F. The pulse is soft, rapid and irregular. The respiration is scanty and may contain albumin, casts or blood. Although always present and extremely intractable. Due to this dehydration thirst is marked. The bowels are constipated and the urine is scanty and may contain albumin, casts or blood. Although prostration is marked, death from this condition is rare.

A differential diagnosis must be made from acute digestive disorders, acute appendicitis, brain or kidney disease, meningitis and the acute infections. The etiology and pathology are obscure, owing to the infrequency of necropsies. Whether the acid bodies are of etiologic importance or whether they are merely morbid products of an underlying pathologic process is in doubt. There is probably some focus of infection in these cases, adenoids, diseased tonsils, an inflamed bowel or appendix, or what not, the toxins from which, being constantly absorbed, act cumulatively on the liver, causing a disturbance of fat and proteid metabolism and producing toxic bodies in the urine. How these cause the characteristic symptoms cannot as yet be explained. The treatment consists in getting at and remedying the focus of infection, and in giving a properly balanced dietary. A low fat diet with ample amounts of carbohydrates is important to preserved the alkalinity of the tissues. Potassium citrate, given in the form of fruit juices, may be used. Constipation must be watched, a periodic emptying with mild aperients being of use in impending attacks. Sodium bicarbonate is valuable because of its stimulation of the excretion of acid bodies, and because of its protective influence on the body fats. To supply the carbohydrate need dextrose is used. In cases of extreme drying out of the tissues a saline infusion may be needed. Prostration and nervous symptoms are treated symptomatically.

HAROLD R. MIXSELL, M.D.

COZZOLINO, OLIMPIO: ZUR FRAGE: STILLEN BEI MUTTERTUBERCULOSE. (SHALL THE TUBERCULOUS MOTHER NURSE HER OWN INFANT?) (*Archiv. für Kinderhk.*, 1913, p. 221.)

The majority of investigators are of the opinion that tuberculosis of the mother is an absolute contraindication to nursing. Schlossmann holds the opposite view. The writer discusses this most important question, after reviewing the evidence pro and con, from four different phases of this subject: (1) Is the tubercle bacillus found in the milk of a tuberculous mother? (2) Do the toxins of the tubercle bacillus appear in the milk? (3) What effect has nursing on a tuberculous mother? (4) What effect has the milk of a tuberculous mother on her nursling?

The weight of evidence is against the presence of tubercle bacilli in the milk unless there is tuberculosis of the breast. Villar (1894) could find only 27 cases of tuberculosis of the breast in the literature. The most important contribution on this subject was made by Noeggerath, who, in 26 tuberculous mothers, found virulent tubercle bacilli in the milk of one, mildly virulent bacilli in the milk of three, and in a fifth case the presence of the bacilli was not positively determined; but Escherich, Vallin, Bang, Fede and de Borris and others could not find any tubercle bacilli in the milk.

Guillemet, Rappin and Fortman, Patron and others injected milk from tuberculous mothers into guinea pigs who were artificially tuberculized, and in nearly every case there was a febrile reaction, proving the presence of a tubercle toxin in the milk. No reaction was obtained in control animals. Normal guinea pigs injected with milk of the mothers usually die within fifteen to seventeen to nineteen days of marasmus. On autopsy no tuberculosis is found in the animals. De Michele and Michelazzi have positively demonstrated the passage of tubercle bacilli toxins in the milk of tuberculous animals.

Schlossmann believes that in certain instances a tuberculous mother may be permitted to nurse her infant, because he believes nursing is less of a strain than is the preceding pregnancy; that nursing increases metabolism and appetite, and that it tends to make the mother fat, and that finally nursing very likely will prevent further conception. The writer denies all these allegations. He believes that the mother and the tuberculous surroundings are far more dangerous to the infant than the mother's milk, and recommends that the infant should be taken from the mother, who is the greatest source of danger. In conclusion, he agrees with Auvard, who said, "If the patient is a girl, she should not marry; if a married woman, she should have no children; if a mother, she should not nurse her offspring."

MARK S. REUBEN.

THERAPEUTICS.

ROLLESTON, J. D., M.D., ASSISTANT MEDICAL OFFICER, GROVE FEVER HOSPITAL, LONDON, ENGLAND: LOCAL TREATMENT OF VINCENT'S ANGINA WITH SALVARSAN. (*The Practitioner*, December, 1913.)

A report of a case of Vincent's angina treated locally by four applications of salvarsan. There was no history or evidence of syphilis and the Wassermann reaction was negative. This is one of 11 cases reported in which salvarsan was used, after the usual treatment by application of "tincture of iodin" or "methylene blue" had failed. The lesions in all but one of these cases healed remarkably quickly, and no toxic symptoms occurred in any case. Either diluted acid or alkaline solutions, the insufflation of the powder, or the application of the powder on a glycerin moistened swab may be used. Applications may be made from one to three times daily. It has been found that this method is more efficacious than the intravenous method, the buccal spirochetes responding more readily to local treatment.

HAROLD R. MIXSELL, M.D.

MISCELLANEOUS.

DAVIS, MICHAEL M., JR., PH.D., AND BARRON, ELMER W., M.D., BOSTON: A METHOD OF PROMOTING THE EFFICIENCY OF AN OUT-PATIENT CLINIC. (*The Boston Medical and Surgical Journal,* December 4, 1913.)

The authors emphasize the fact that inasmuch as the return of patients is left very much to chance, the proportion of lost patients is a large one. In the children's medical clinic of the Boston Dispensary, one-third of the infant-feeding cases were not brought back for treatment. To overcome this the "Index Visible" system, devised by Professor Fisher, of Yale, was utilized. The system case contains 31 aluminum strips suspended from a rod in such a way that they are easily moved from one position to another. The numbers on the strips indicate the days of the current month, and the order of the strips is changed daily so that the date on the first, or left hand strip, is always three days behind the calendar. Each card is filed under the date at which the patient is expected to return. If the case is especially important and the physician desires a postcard to be sent, a capital "P" is placed on the card. This serves as an order to the clinic clerk to notify the patient if he hasn't returned up to the third day after the date named. As patients return for treatment their cards are shifted along from date to date, according to the desired time of return. If two postcards have been sent without response, the fact is reported to the physician, who determines, according to the medical needs of the case, whether the patient shall be referred to the Social Service Department to exercise personal persuasion, or to ascertain why return hasn't been possible. The physician, on the other hand, may decide that the case may be dropped. This system has been in operation about one year and has been found to work remarkably well, the "Visible Index" being of the greatest service. In three months it raised the average number of visits per patient from 2.5 to 4.3, the child thereby receiving about double the amount of medical service. The cost proved to be a little over one cent per average visit. HAROLD R. MIXSELL, M.D.

BOOK REVIEW

UBER DEN HOSPITALISMUS DER SÄUGLINGE. (HOSPITALISMUS IN INFANTS.) By L. F. MEYER. 4 marks. 78 pages. Berlin: S. Karger, 1913.

The reason infants do not do as well in institutions as in private homes is due, according to Meyer, to three causes—infection, unsatisfactory diet, and incompetent nursing. The chief of these causes is infection.

Meyer shows that an infant who remains in an institution longer than one month almost invariably suffers from an attack of grippe during that time. During a stay in an institution of 100 days the infant has, as a rule, three such infections.

By grippe Meyer means an acute infectious catarrh of the respiratory tract. This infection is usually caused by the pneumococcus, but the influenza bacillus, the streptococcus, and the micrococcus catarrhalis have also been isolated in some of these cases.

Grippe usually begins with a coryza, with restlessness and general malaise. There may be present a rise in temperature, but this is not always observed. Various complications follow, such as bronchitis, pneumonia, otitis media, pyelocystitis, peritonitis and diphtheria.

If these attacks of grippe could be avoided the death rate in institutions would be much diminished.

As a remedy for this condition Meyer suggests better nourishment for the infants and better nursing.

Meyer's article contains a series of tables which show how the mortality rate has been lowered in recent years by better nursing and better methods of feeding. The great problem now is to do away with attacks of grippe. JEROME S. LEOPOLD.

ARCHIVES OF PEDIATRICS

JUNE, 1914

ROYAL STORRS HAYNES, PH.B., M.D.,
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EDITORIALS

A CLEARING HOUSE FOR INFORMATION ON THE MEDICAL ASPECTS OF CHILD WELFARE.

The ARCHIVES is glad to express its appreciation of the plan advocated by Dr. Hamill, in his presidential address before the American Pediatric Society, of making certain committees of that body centers for authoritative information as to the medical aspects of welfare work, child labor, birth registration, midwifery and kindred subjects.

Physicians as a class are perhaps more conservative even than capitalists, and in the onward sweep of medico-sociological work, while many of them have been in the forefront of the various activities, yet many of the most eminent pediatrists have felt that they were being drawn into the work through popular clamor. Thus the American Pediatric Society, which undoubtedly stands at the head of pediatric work, has hesitated to announce that it considered sociological problems as part of its accredited sphere.

The time has certainly come when the mere multiplication of activities has allowed exaggeration and eccentricity to creep into the statements made by workers in various lines so that personal prejudices and fads have been issued with the trappings of absolute medical truth. Conflicts were thus bound to occur and have occurred, with prejudice to the work in the minds of those who could not weigh and consider the evidence.

It will be a great gain to all who are interested in the various forms of social betterment to have their medical problems—and all of them are based on medical problems—reviewed by a high court whose opinions will have the weight of eminent authority. It will also, in our opinion, benefit the American Pediatric Society to assume such responsibility.

A REMONSTRANCE.

We publish the following letter received from a well-known pediatrist who feels that the excerpt from the report of the Babies' Welfare Association printed last month was unfair. The ARCHIVES feels, with him, that the dispensary difficulties lie along the lines of treating for nothing patients who can pay and of not furnishing enough material incentive to the dispensary physician:

TO THE EDITOR OF THE ARCHIVES OF PEDIATRICS:

Dear Doctor: In the May number of the ARCHIVES you have reprinted "an incident in the dispensary problem" from the report of the Babies' Welfare Association for the week ending May 2, 1914. In this report I believe an injustice is done a large number of dispensary physicians who give largely of their time, energy and experience. The writer of the report has not presented the matter fairly. It may be poetical license and it certainly makes the story more interesting, but are not the facts exaggerated? The dispensary benches are spoken of as "hard, uncomfortable, wooden benches," but are they any more so than those which we are all accustomed to sit on? The hospital is stated to be "one of the largest, best-equipped and most generously maintained in the city." It does not seem probable that in such an institution a patient would have to sit patiently "a *great many* mornings to be told that the doctor who treated such cases would not be around that day." "The man's little son had infantile paralysis" and was "a *hopeless* cripple, unble to move or to walk, and many times even to speak," and still it is stated that "if he could have had the proper medical treatment he would have been able to grow stronger and help to fight the trouble." The boy died after months of "intense suffering." Surely this was not due to his infantile paralysis, but the reader gets the impression that the attending orthopedic surgeon was responsible. Would it not be only fair to state that the same physician had successfully treated many hundreds of patients with infantile paralysis in that same institution? The present methods of treatment of dispensary patients are far from perfect, but I believe such criticism is unjust and harmful. The lay reader must get the impression that, as a rule, dispensary physicians are lazy and neglect their duty. It is not easy to get good assistants now and such criticism will not encourage others to take up the work. It is stated that the institution in question is "most generously maintained"; that is, everyone is paid except the physicians who do most of the work. This particular physician is criticised for not being regular and punctual in attendance, but it is said that "the doctor had telephoned he would not make that hospital that particular day, but could be found at another clinic some twenty blocks away." Surely no one would accuse such a physician of lack of industry. The writer of the report asks these three questions: First, Are there not enough public clinics? Yes. "The long, hard, wooden benches closely packed with people" simply indicate that a large number of patients who are able to pay for medical services are receiving treatment for nothing and are preventing those who are really poor from receiving adequate attention. Second, Are there not enough doctors willing to help care for the people who come? Yes, if they are really poor and deserving, but how is it possible for a physician to derive any benefit from his work if he is compelled to treat a very large number of patients in a comparatively short time. Lastly, Is there something wrong with the system? Yes. Only the deserving poor should be treated, and if regular and punctual attendance on the part of the physician is to be obtained he should be remunerated for his services.

Sincerely,

ORIGINAL COMMUNICATIONS

ORGANIZED CO-OPERATION IN INFANT WELFARE WORK.

BY GARRET SMITH,

Executive Secretary of the Babies' Welfare Association, New York City.

Of the making of many organizations there is no end—to paraphrase the Hebrew sage. Nowhere is the fact more obvious than in the field of social service, particularly in the direction of public health work. Out of this vast multiplication of agencies serious problems have arisen. One of the most significant and, so far, most successful efforts to solve these problems has been the infant welfare federation. In this movement New York City has been a pioneer. Believing that the metropolitan field embraces on a large scale all of the various perplexities which confront any smaller community, I venture to present the experience of the Babies' Welfare Association in New York City with the hope that our experience may be useful in other fields.

In former generations social work was performed by individuals—the private philanthropist, dispensing bounty whither his sympathies led; the free-lance social worker, the private nurse and physician. Overlapping of effort, diverse and unscientific methods, jealous bickerings, wasted energy resulted. The remedy was the organized welfare society, uniting individual effort and incorporating the funds of the philanthropist.

But, alas! it would seem that every individual social worker of a half century gone had become the prophet of a school. Each theory of public welfare became crystallized in a separate society, represented by a separate organization. As a result there are today as many distinct welfare societies as there were individual social workers fifty years ago, and the problem of duplication of effort is more acute than ever. It is no mere figure of speech to say that the poor and the sick are being organized to death.

But destructive criticism is not the purpose of this article. We are governed by a permanent condition which must be met accordingly. Many charity organization efforts have been made in recent years in different communities with a view to uniting groups of small societies in one new body. The difficulty has always been that these societies have been unwilling to surrender their identity, their names and their traditions by thus merging.

The problem then is not to do away with the individual organizations or to ask them to surrender any of their prerogatives, but to provide a scheme of practical, organic coöperation by which friction, overlapping and wasted effort can be eliminated. In meeting this need we believe that the Babies' Welfare Association of New York City has gone far toward success and is working in the right direction. While it is true that New York City presents difficulties of greater extent and complication than perhaps any other city of the world, yet we believe that the essential principles are the same wherever two or more distinct agencies are attempting to fulfill similar or allied functions in the same field.

For example, if there be one hospital, one charitable society and one or more churches in a town doing social work, we immediately have the nucleus for a small Babies' Welfare Association; in fact, the smaller the field the more likely are these organizations to duplicate each other's work if they have no working understanding. We believe that the lesson in the possibility of coöperation under the greatest difficulties learned in New York City, can be applied in modified form in smaller communities much more easily.

Stamford, Conn., is a case in point. Here is a city of 15,000 inhabitants that has one hospital, a Visiting Nurse Association and a Bureau of Charities, which includes a number of churches, lodges and other societies. From these few elements they have decided that they can profitably organize a Babies' Welfare Association.

There are in New York City nearly two hundred organizations directly or indirectly interested in infant welfare work. These include, beside the Division of Child Hygiene of the Department of Health, private societies conducting infant milk stations, visiting nurse associations, hospitals accommodating babies, day nurseries, relief agencies, outing societies, which give vacations to mothers and babies, and committees doing research work in the field of infant mortality.

When public health authorities and social workers began to place special emphasis on infant welfare work a few years ago, the vast amount of duplication and overlapping among these independent agencies became acutely apparent. The first attempt to harmonize these conflicting elements took the form which has been employed in so many cities throughout the country, that is, an annual conference known in New York as the Conference on the Care of Babies. This went no further than an annual academic discussion and comparison of notes. It furnished no everyday working basis of coöperation. This, I believe, has been a common experience wherever it has been tried. In 1911 the infant milk station became recognized as a center of infant welfare work in New York City. This has become the general tendency all over the country in the last few years, wherever infant work has been taken up. We had in 1911 in New York City seventy-eight infant milk stations, including those run by the Board of Health. For the first time these stations were kept open all the year round.

This development made the lack of coöperation felt more acutely than ever. It was apparent, too, that the milk stations must take the lead in remedying the evil. These seventy-eight stations were divided up among seven different organizations, and locations had been established absolutely without reference to each other. In some sections there were three or more stations within a radius of two blocks, while the other needy neighborhoods were neglected altogether. Nurses of different organizations were combating each other for cases in the same field, and this competition often led to bitterness. No two of these societies had exactly the same theory as to the functions of the milk station or ran their stations by similar methods.

The first definite step toward getting these people together was taken in the spring of 1911 with the formation of the Association of Infant Milk Stations. This was simply a federation working through an executive committee made up of one representative of each organization and having an executive secretary and central office at the Department of Health. This committee began the work of districting the city and inducing the organizations to divide these districts up among themselves, so that there should be one station in the district, each society agree-ing that its nurses should do no canvassing outside their own districts. Weekly reports of the milk stations were sent in to the central office, compiled and sent to the members of the Association. This attempt was successful as far as it went. It was felt at last that the first practical step toward organic coöperation had been taken.

The experience of that summer taught, however, that the Association was too limited in its scope. While the milk stations were reaching agreement among themselves they were still failing to coöperate with hospitals and dispensaries, the relief societies, the day nurseries, and so forth, and as these other organizations were not represented in the Association there was no common authority to which differences could be referred. Moreover, as babies were constantly being transferred from the milk stations to the care of these institutions and back again, it was evident that there was need for a clearing house of the broadest possible scope. In June of 1912, therefore, at a conference of representatives of all the different classes of agencies in the field, the Babies' Welfare Association was formed as a substitute for the Association of Infant Milk Stations. This, too, like its predecessor, is a mere federation without any formal written constitution. Its membership consists of the component societies which in no way lose their identity or independence. They bear to the Association the same relation that the individual banks do to the Clearing House Association.

The machinery adopted to bring this about has been tried in several communities with success, and with necessary local modifications, I believe, can be used as a model anywhere. The nucleus of the Association is a General Committee, consisting of one representative and an alternate elected by each society. This committee meets once a year, discusses general policies, approves the work of the past season and outlines plans for the coming season. At the same time, besides the honorary officers, it elects an Executive Committee to carry on the detail work. This Executive Committee consists of nine members, all active social workers, so chosen as to represent the different groups of interests in the field. The committee elects its own chairman and hires an executive secretary and assistant executive secretary to carry on the work of the Clearing House.

The detail work is further divided among the sub-committees. The chairman of the Executive Committee appoints from that committee chairmen of the sub-committees, each sub-committee taking up one general division of the work. Each chairman, thus appointed, in turn chooses as members of his sub-committee a representative of each of the organizations doing work in his particular field. These representatives are selected from the General Committee. The sub-committees at present found necessary in New York City are those on Milk Stations, Hospitals and Dispensaries, Social Service, Temporary Care, Publicity and Statistics, Better Babies' Contests, and Central Office. This sub-committee arrangement could be varied indefinitely according to the needs of the particular community organizing such an association.

Of course a vital consideration in any community making an attempt of this kind is the financial one. Such an association could not be a success on any scale without a paid executive secretary to devote his whole time to the work. In addition to the secretary's salary and the necessary stenographic service and office rent and equipment, the necessary publicity and its printing and distribution is a considerable item. There is usually a serious objection to forcing an organization of this kind into an already crowded field as a new appeal agency, which means raising an additional budget. The plan adopted in New York City to meet this point, I believe, should hold true anywhere. By establishing a coöperative clearing house the agencies taking part in it are increasing their own efficiency and are therefore justified in devoting some funds to it from their regular budget. Usually in a community there are one or more agencies particularly interested in promoting coöperation. These agencies may be induced, at the outset at least, to bear the major part of the expense of an association. We were particularly fortunate in this respect in New York City. The Board of Health, which is of course a member of the Association, gladly contributed office room and furnishings and stenographic service. Two other agencies, whose chief purpose is the promoting of new work, volunteered to pay the salaries of the executive secretary and assistant executive secretary and a field investigator, together with the principal cost of printing and publicity. It was, therefore, unnecessary for the Association to have a committee on ways and means or to trouble itself at the outset with a budget. Many of the organizations in the Association, however, have contributed small sums to a central office fund for incidental expenses. Such great interest has been manifested in the movement, however, that it is believed within another year the Association will become self-supporting. It has now ninety of the most active organizations in the city enrolled, and the officers of these societies frequently express their conviction that the Association has become an essential feature of the work in New York City and could not, on any account, be allowed to drop because of lack of financial support.

One of the first steps necessary in a movement of this kind is to make a complete survey of the field in order to discover just what resources are available, and to place this information within reach of all the coöperative agencies, and at the same time to discover in what direction there are the greatest immediate needs for new work or for better coöperation between existing agencies. This survey has been completed in New York City and the results published in the form of a convenient field manual charting all the agencies of the city in parallel columns with topographical arrangement. This publication has been printed by the Department of Health.

It will be possible in a brief article to touch on only a few of the chief problems we have so far taken up. Most of these problems are much more complicated in the metropolis than in other communities. Some of them do not exist at all in the smaller communities. My chief reason in presenting them, therefore, is to show how successful organized coöperation may be made under the most difficult conditions, and to encourage smaller communities by making it clear how much more easily the result can be brought about in the community where the problems are less complicated.

One of the first was a need of a system whereby sick babies could be quickly transferred to a hospital when necessary. In the past the workers of other agencies have been greatly hampered by lack of definite knowledge as to just what the hospital facilities for babies were. Under the direction of the Subcommittee on Hospitals and Dispensaries complete information regarding all hospitals taking babies was obtained and tabulated at the central office. Arrangement was made with these hospitals whereby anyone wishing to place a baby could call up the central office of the Babies' Welfare Association and leave the case with the executive secretary, who was able, without delay, to make arrangements with the nearest hospital for receiving the case. By this system it was found that a case could generally be placed in fifteen minutes which had often taken many hours of the busy nurse's time, thereby frequently resulting in loss of life.

Another need discovered was that of adequate temporary day and night shelter for well babies during the sickness of their mothers. Only two institutions in the Greater City were regularly doing that work to any practical extent. The boarding-out system was not adequate for this need, and such as it was it demanded closer supervision. Under the direction of the Subcommittee on Temporary Care this subject was studied, and as a result several day nurseries in different parts of the city were induced to add day and night accommodations for a limited number of babies. In addition to this, by arrangement with the Board of Health, a copy of the list of new boarding-out permits was received at the central office of the Association each week. From this was gradually compiled a preferred list of women who have been tried and found satisfactory for this work. The placing of babies in these shelters is also carried on through the central office as a clearing house.

It was also found that there was no satisfactory arrangement with the relief societies for providing free milk for babies in emergency cases. When a family was unable to buy milk for its baby there was often a delay of from three days to a week before the relief society could properly investigate and grant relief. This delay was costing many lives. The Sub-committee on Social Service, on which the relief societies were represented, took up this problem and perfected a satisfactory arrangement whereby the relief societies grant milk relief at once without investigation on the word of the milk-station nurse, pending the result of the usual examination of the case. This sub-committee also took over the administration of the Knickerbocker Free Ice Fund, administering it with great saving of duplication.

When prenatal work began to grow popular during 1913 the Sub-committee on Milk Stations took this up as an extension of its activities and drew up a uniform plan for the guidance of all agencies wishing to go into this work.

At the same time the Better Babies' Contest idea developed in New York and it became apparent that, properly controlled, this could be made a useful agency in infant welfare work. A Sub-committee on Better Babies' Contests was organized, the city was districted, and the contests throughout the Greater City were carried on, and are still being carried on, under a uniform plan which emphasizes the attendant educational work with mothers and bases the prizes on improvement.

One of the most important functions of the Association is educational publicity, in which it has been increasingly active throughout the year. Weekly bulletins on the health of the city's babies, together with other special news from the field, have been distributed regularly to the Association's members. A method of keeping in touch with the health of the city, based on the division into small districts instituted by the New York Milk Committee, has been made use of by the Association in concentrating work in fields where it is most needed. The Association has distributed, during 1913, 35,000 "clean-up" circulars; 5,000 telephone hangers giving the facilities of the Association; 10,000 copies of a booklet of "Talks to Mothers," prepared by Dr. S. Josephine Baker for the Association; 500 case record pads for use in transferring cases from one institution to another, and 15,300 milk-station directory cards.

In all this infant welfare work we believe that the obtaining of newspaper publicity of the right sort is most essential. In this respect the coöperative association has great advantage. The central office acts as a publicity bureau for every organization within the Association. By means of weekly reports, to which all the organizations in the Association contribute, the central office is kept supplied with the latest news in every angle of the field. A little personal work with the editors of local newspapers will always secure their coöperation in giving notice of the items sent out by the Association. In New York City our newspapers have given us publicity of two kinds—weekly news items showing the infant mortality record for the week and any other special items of interest at the time, and frequent special articles given exclusively to one newspaper at a time. During the heat of the summer, when there is a special interest in infant welfare work and the ordinary run of news is light, we have found several different papers willing to run a series of special articles like "Talks to Mothers," by one of our public health officers, or a series of articles on home sanitation, etc. Frequently a daily paper has published an illustrated page article in its Sunday section. This newspaper publicity serves two purposes, and from this standpoint is also divided into two classes, one class being the kind of publicity which interests the general public in infant welfare work and induces those who have money to subscribe to it. The other class is educational publicity for mothers and fathers. This matter, we found, can be very effectively used in the daily papers which circulate largely in tenement districts, particularly in the foreign papers.

Perhaps no greater proof of the success of an organization of this sort can be offered than the way the work of our central office has steadily increased. During 1913 our clearing house reached over 5,000 different babies; 330 of these cases were handled directly by the office. Everyone of these cases thus handled directly means three to five telephone calls and often involves one or more letters.

While the Association is primarily for the purpose of facilitating work in New York City, it is by no means restricting its influence to that territory. We are very glad at any time to receive visitors who are interested in our work and will make arrangements for conducting them about the field here. We are also glad at any time to send our literature to those inquiring for it and to place enquirers on our mailing list. During the past year representatives have called at the central office for advice in regard to work in Boston, Baltimore, Denver, Williamsport, Va., South Orange, N. J., Grand Rapids, Mich., Stamford, Conn., and other cities. On written request such information has been sent to Pittsburgh, Cleveland, Boston, New Orleans, Baltimore, Denver, Albany, Florence, Italy; Madrid, Spain, and many smaller cities. The Association here has been adopted as a model for organizations in several of these cities, notably Boston and Philadelphia. Milk-station statistics have been sent regularly to the State Department of Health. Statistics and other data have also been given, by request, to the National Child Welfare Committee, Vanderbilt Clinic, Columbia University, Fordham Hospital, the New York *Journal,* Board of Education of New York City, Russell Sage Foundation and the State Charities Aid Association.

Moreover, we believe that this system of federation is a solution of the problem of linking the private and public agencies together on a coöperative working basis. In conclusion I would present the following general outline suggestive of the way in which the functions making for public health should be divided between the public and private groups of coöperating agencies:—

PUBLIC.

Keeping of Public Health Records; Complete Registration of

- Births.
- Deaths.
- Tabulations.
- Study of data.

Sanitary Control to Obtain

- Clean milk.
- Clean water.
- Clean food.
- Clean streets.
- Clean houses.
- Clean factories and workshops.

Control Over Infectious Diseases Through

- Compulsory reporting.
- Effective quarantine.
- Preventive measures.
- Education.

Sanitary Control Over Disposal of Refuse and Water.

General Supervision Over

- Midwives.
- Private maternity hospitals and dispensaries.
- Day nurseries.
- Milk stations.
- Kindergartens.
- Institutional babies.
- Boarded-out babies.
- Schools.
- Common boarding-houses.
- Public hospitals and dispensaries.

PRIVATE.

By Survey of Private Civic Agencies Determine

- Number, character and scope of activities.
- Financial support.
- Special interest.
- Personnel—leaders.

Correlate Activities of Private and Public Agencies Through Central Committee on Federation

- To adopt and promulgate health laws and ordinances.
- To stimulate public interest in health efficiency.
- To formulate a health programme.
- To supplement activities and facilities of public agencies.

Private Agencies Possessing Potential Possibilities in Planning and Carrying Out a Public Health Programme—

- Local Medical Society.
- Chamber of Commerce (or Board of Trade).
- Woman's civic clubs.
- Granger organizations.
- Labor organizations.
- Church organizations.
- Fraternal organizations.
- Hospitals and dispensaries.
- Day nurseries.
- Visiting nurses' associations.
- Child welfare agencies.
- Schools.
- Tuberculosis agencies.
- Public press.

SOME CONSIDERATIONS CONCERNING STILL'S DISEASE AND ARTHRITIS DEFORMANS.*

BY JOHN B. MANNING, M.D.,
AND
FRED. J. FASSETT, M.D.,
Seattle, Wash.

For a year or two after George F. Still of London, England, first published his paper in 1896 on "The Chronic Progressive Enlargement of the Joints, Associated with General Enlargement of the Glands and Enlargement of the Spleen" in children, the literature contained not a few references to this condition of Still's disease with grouped and isolated case reports. However, during more recent times, fewer references to it can be found.

During the period from October 28, 1913, to February 13, 1914, the *Zeitschrift fur Kinderheilkunde* (referate), which contains reviews on children's literature more systematically than any other journal published, had but one reference to Still's disease as such, one published by H. Koeppe, a case report, in the *Jahrbuch f. Kinderheilkunde,* 76, s. 707-716, 1912. No doubt many are described under chronic multiple joint infections in children as rheumatoid arthritis or conditions simulating it, as some people think that there is no doubt but that Still's disease is merely a somewhat peculiar form of infectious arthritis and that there is no justification for setting these cases apart and giving them a special name.

Those who have reported cases of Still's disease as such in recent years, in most instances have taken particular pains to state that there were no bony changes as indicated by radiography. The accompanying radiography, however, shows in addition to the articular and periarticular thickening of the soft structures around the knee-joint, which is the most constant description of the pathology so far as joints are concerned, some decalcification of the bone with a thin cortex. While such *bony* changes we believe are consistent with long standing disuse, we also believe that this case, having all the characteristics otherwise of Still's disease, strengthens the contention of many that Still's disease represents the same process as arthritis deformans and that the longer the process persists the more likelihood of bony changes occurring, as are commonly seen in arthritis deformans. Furthermore, the prevailing opinion that the underlying etiology is an infective process, we believe is borne out in this case with two separate possible focii of infection, a discharging ear and suppurative condition of the teeth of long standing.

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* From the Children's Orthopedic Hospital, Seattle, Wash.

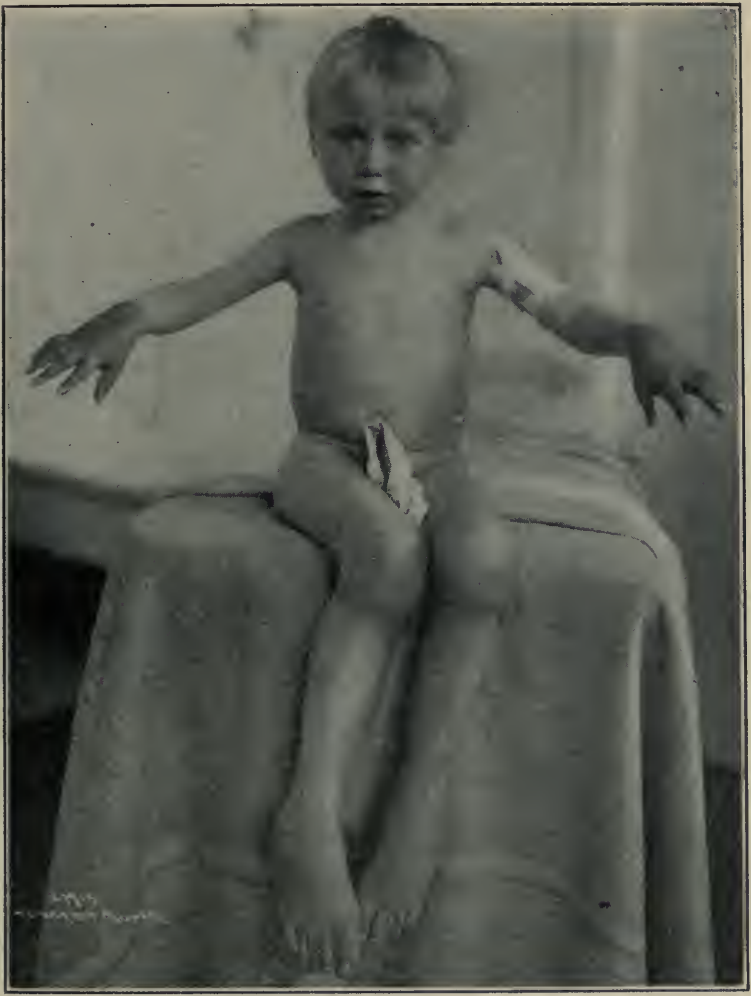

FIG. 1.—Showing enlargement of wrists and knees and finger joints.

One of us (M) spent two weeks last year at Dr. George F.

Still's clinic at the King's College Hospital of London (he is now only associated with the Great Ormond Street Hospital for Sick Children in a consulting capacity) and, fortunately, heard his own presentation of a probable case of this sort which was in the ward at the time.

History.—This boy first came under our observation in the early fall of 1913, at seven years and three months, with the following history: The father, mother and five other children living and well. This boy was born in a normal labor and was perfectly well until about two years of age, when he had a discharging ear of a persistent nature. At three years, it was first observed that there was swelling and tenderness of the knee and ankle joints, gradually involving other joints. He was in bed all this time with some slight fever. Since that time there has been a gradual progressive involvement of practically all joints with periods of apparent slight improvement.

Examination.—The patient was a fairly well nourished, but poorly-developed boy. The skin was of good color, but the mucous membranes were pale. There was no retraction or rigidity of the neck. The pupils were of equal size and reacted alike to light. The eyes were but slightly prominent. Mouth-breathing was noticeable. The teeth were badly decayed. The tongue was coated, the tonsils slightly hypertrophied but clean.

Superficial Glandular System.—There were numerous glands in both cervical regions varying in size from that of a pea to that of a small walnut. There were numerous other smaller glands in the axillary, epitrochlear and inguinal regions.

Chest.—Both sides moved slightly but equally. There was slight dullness of the left lung at the apex with slightly prolonged respiratory breathing. No râles were obtained.

Heart.—Left cardiac border at left nipple line. Right border was at right border of sternum. The sounds were clear and of good quality. There was considerable irregularity of rhythm.

Abdomen.—The level of the abdomen was below the level of the chest. The liver dullness extended from the sixth rib to one finger breadth below costal margin in right nipple line.

Spleen.—The spleen was distinctly palpable one finger breadth below costal margin in left nipple line.

Extremities.—Both elbows, both wrists, index and little fingers of right and left hand were enlarged, slightly tender and markedly limited in their motion. Both hips, knee and ankle joints similarly enlarged with slight tenderness but almost complete fixation. There was a similar rigidity, somewhat tender, on slight motion of the cervical spine.

Blood.—White count, 7,100. Blood smear:

Polynuclear leukocytes,	67%
Mononuclear "	
a Small	16%
b Large	16%
Eosinophiles	1%

No nucleated reds and no poikilocytosis. Cutaneous tuberculin reaction was negative at forty-eight hours.

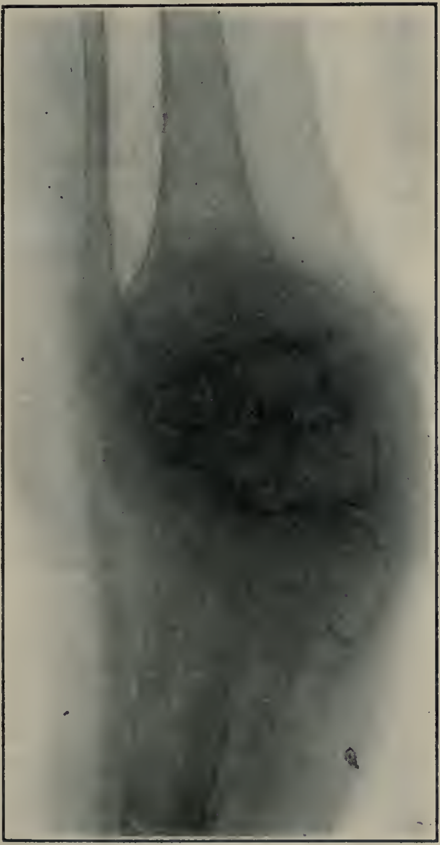

FIG. 2.—Roentgenogram, showing articular and periarticular thickening of knee joint.

Urine.—Slightly acid reaction, no albumin, no sugar. Sediment: Abundance of calcium oxylate crystals; no pus cells; no casts and no blood.

X-Ray Examination.—Dr. H. B. Thompson, Roentgenologist to the Children's Orthopedic Hospital, reported the X-Ray examination showed decalcification of bones with a very thin cortex. There was an articular and periarticular thickening of the soft structures around the knee and wrist joints, and a partial subluxation of the knee joint. There was also a distinct change in the structure of the lower end of the shaft of the femur extending on the inner side for about 3½ inches above the joint. This gives a somewhat honeycombed appearance but not as distinct as is usual in tubercular affections.

The intestinal tract shows nothing abnormal except a rather large and redundant sigmoid. Stomach is normal in size, position and mobility, as is also the colon.

Progress and Remarks.—In the Children's Orthopedic Hospital the treatment has consisted of rest, fresh-air, a full mixed diet, manipulations under ether and traction in bed to correct the flexion deformities of the lower extremities. In addition, several carious teeth have been removed. A copious discharge of pus was observed in all instances from the tooth root immediately after extraction. Since that time, there has been a constant decrease in pain and increase in range of active and passive motion of all the affected joints.

In conclusion, we are of the opinion that this case bears out the contention of many that the line between Still's disease and the infectious type of arthritis deformans is extremely ill defined. A consistent improvement with the removal of the suppurative focii suggests the part infection plays in etiology.

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PATHOLOGY AND THERAPY OF DIABETES INSIPIDUS.—Benario, an assistant of Ehrlich, sums up his study of this subject as follows: The posterior lobe of the hypophysis is of importance for the pathogenesis of this affection. In a case described a syphilitic gumma in this locality caused a disturbance. The variability of the affection can be connected with the evolution and involution of the gumma. Antiluetic medication may or may not act specifically and when it is ineffective we may understand that the gland has become sclerosed. Syphilitic infection must reach the hypophysis through the lesions of basilar meningitis, but, according to Arnozan, this is not the sole way, for it could also coexist with disease of the sphenoid bone. In tertiary syphilis with polyuria, the nasopharynx must be carefully examined for this possibility, because of the frequency of gummata in this locality.—*Medical Record.*

AMERICAN PEDIATRIC SOCIETY.

Twenty-sixth Annual Meeting, Held at Stockbridge, Mass, May 26, 27 and 28, 1914.

THE PRESIDENT, DR. SAMUEL McC. HAMILL, IN THE CHAIR.

PRESIDENT'S ADDRESS.

DR. SAMUEL McC. HAMILL, of Philadelphia, made this address. After paying tribute to the memory of Dr. Forchheimer, Dr. Rotch and Dr. Putnam, whose stimulating influence in this Society and whose contributions to the subject of pediatrics would be greatly missed, Dr. Hamill took as the text of his remarks a quotation from the first volume of the Transactions of the Society, and the first Epistle to the Pediatricians by Dr. Jacobi. It read: "Questions of Public Hygiene and Medicine are both professional and social. Thus every physician is by destiny a 'political being' in the sense in which the ancients defined that term, viz., a citizen of the commonwealth, with many rights and great responsibilities." After dealing at length with the close interdependence of pediatrics, general medicine, surgery, neurology and all other branches of medicine, he emphasized the relationship of pediatrics to the most vital questions of public hygiene. Though Dr. Jacobi had been the pioneer in pointing out this duty of the American Pediatric Society, others had from time to time suggested that, while the Society was founded to stimulate and encourage scientific research to the highest degree, it should assume broader obligations and grapple with larger problems. In the light of the standing of this organization it did not have the right to refuse consideration of the vital problems of preventive medicine that were being unwisely and irrationally disposed of by men and women who were often swayed by sentiment and who were without the knowledge of medicine upon which, in the final analysis, every problem relating to the child must rest. Dr. Hamill said he would not convey the impression that the American Pediatric Society should sacrifice one particle of its scientific endeavor along lines of laboratory and clinical research, but that it should add to its programme scientific investigation along the lines of preventive medicine as it applied to the welfare of the child. The subjects of birth registration, the regulation of the midwife, the problems presented by the day nursery and the foundling institution, and the problems of school hygiene all demanded their attention. Many of the private schools for boys, and the great majority of girls' schools, as housed in our cities, are a menace to the public health. They are receiving neither medical advice nor supervision. The problems of the physician and the sociologist are inseparable. This was well illustrated in the matter of the health aspects of the Child Labor problems. The knowledge which the pediatrist alone could give would prevent the enactment of laws which are unwise and unjust both to the child and to his parents and employer. The health departments of some of our cities have made special provision for the care of the city child by the creation of departments of Child Hygiene and this Society should do all in its power to stimulate the creation of such departments, rightly conducted, that the terrific mortality and morbidity amongst infants and children may be reduced. Much of the invalidism of the adult, mental and physical, much of the moral obliquity of the child and the adult, have had their foundation in the neglect of the medical aspect of these sociological problems.

As to the method of procedure, the suggestion of Dr. Edsall, that this Society act as a center for the accumulation and dissemination of knowledge relating to these subjects, is admirable. We could not treat all the innumerable themes that are awaiting us at once, but we could bring them up one by one at the yearly meetings. Dr. Hamill said he therefore recommended that at the present meeting three committees of three members each be appointed—the first to study the present status of the Child Labor problem, and to present a critical and constructive report at the next annual meeting; the second to study the vulvovaginitis problem in its relationship to public health, its report to be submitted at the same meeting; and the third to be known as the Committee on Coöperation with the Children's Bureau of the United States Department of Labor.

THE USE OF DAHLIA.

Dr. John Ruräh, Baltimore, said that for a long time anilin dyes had been known to exert a certain antiseptic action, and certain practical applications had been made as a result. Dr. Ruhräh reviewed the work of Pfeiffer, Rozeahegyi and Still-ing as to the effects of these dyes on the higher plants and on bacteria. The curative action of dyes was known to workers in dye factories, among whom it was the custom to treat skin wounds by dusting them with various dyes. The selective action of these dyes had led to their use in culture media. The essayist also described the work of Churchman and of Simon and Wood. The latter had shown that an acid dye, irrespective of its color, in the standard concentration of 1-100,000, was devoid of bactericidal properties, while a basic dye, irrespective of its color, might possess inhibitory power. Simon and Wood stated that this inhibitory effect upon the growth of bacteria is not referable to color, but to chemical structure (triamino-triphenyl methanes). In another contribution they show that the inhibitory action upon the growth of certain bacteria which had been demonstrated to be common to all the members of this group was not the exclusive property of this group of anilin dyes, but was manifested also to a greater or less extent by other strongly basic dyes. They have also demonstrated that certain bacteria belonging to groups ordinarily susceptible to dyes may grow in their presence, and many organisms overcome the susceptibility by adaptation. May and Heidingfeld, in the study of fuchsins, found that the most basic, rosalin acetate, is also the most toxic for bacteria, while the acid fuchsins are not toxic at all. They found that a solution of basic fuchsin killed in five minutes typhoid, paratyphoid, tubercle bacilli, staphylococci, and the oidium albicans. They also found that a 1 per cent, solution did not produce any irritation of the mucous membranes and could even be injected into the bladder. They found, further, that 1 per cent. ointments could be used in the treatment of ulcers and abrasions. Two years ago, in searching for an efficient local application for streptococcus infection of the throat, Charles Simon suggested dahlia. He had started in with a very weak solution and soon found that the saturated solution, that was about a 4 per cent. solution, could be applied to the mucous membranes of the throat, or any other part of the body, without producing pain or subsequent irritation. The drug seemed to penetrate only a short distance and for the deeper affections had no value, but for superficial involvements of the mucous membranes, whether due to streptococcus or to other organisms, the effect was quite striking. In some cases very little effect was noted, but in others there was a marked lessening of the intensity of the inflammation and coincidently a marked lessening of the constitutional symptoms. It had the advantages over other applications in that it was not painful, did not produce irritation, and was markedly antiseptic. Its only disadvantage was its color. For ulcerations about the mouth it might be applied in saturated solution or a mouth wash varying in strength from 1-1,000 to 1-10,000. The dahlia not only killed the offending organism, but had a marked effect on the healing. In Dr. Ruhräh's experience it had had remarkable effect in vaccinations that were slow in healing, and upon abraded surfaces, particularly those that were infected. Others had used it with satisfactory results in erysipelas, acute and chronic eczema, herpes, tinea, tonsurans and furunculosis. It may be used in skin lesions caused or accompanied by pus organisms with reasonable hope of success.

DISCUSSION.

Dr. L. Emmett Holt, New York, asked whether dahlia had been used in diphtheria.

Dr. John Ruhräh replied that in a few cases they had used lactic acid and some of them did well. A 5 per cent. solution was employed.

Dr. Charles Gilmore Kerley, New York, asked Dr. Ruhräh if he had used dahlia in poison ivy.

Dr. Ruhräh replied that he had not used it in poison ivy, but that it could do no harm to try.

Dr. Abraham Jacobi, New York, referred to a paper which he had published some eight years ago in the *Journal of the American Medical Association* on the effect of methyl blue in cases of cancer. This paper called attention to the advantages of methyl blue in chronic cancer when given, not subcutaneously, but internally. This paper had been overlooked and neglected in a very conscientious manner, as many good things were. He had used methyl blue in this way for twenty-three years and was still satisfied with it.

THE DIAGNOSIS OF WHOOPING-COUGH BY THE COMPLEMENT DEVIATION TEST.

Dr. Alfred Friedlander, Cincinnati. The purpose of this preliminary report is to record the fact that we have succeeded in making the diagnosis of whooping-cough in all stages—

catarrhal, paroxysmal and convalescent—by means of the complement deviation test. Early diagnosis is important both in the control of the spread of this infection and in the effects to be derived from the vaccine treatment, as it is a matter of record that the success of vaccine therapy depends in a large measure on the time of its application. The earlier the vaccine is given, the better the results. After describing in detail his technique (*Journal of American Medical Association,* March 28, 1914) Dr. Friedlander stated that this test had been used in 18 cases of whooping-cough with a positive result in every case; in 8 normal children, with a negative result in every instance; in 3 cases in the catarrhal stage, with two positive and one negative result; and in 1 case, not whooping, but in every other respect typical of the disease, with a positive result. It was of interest to note that 9 of the positive cases were in the first week of the whoop and 3 early in the second week. Every case examined in the paroxysmal stage had given a positive result. In no case had they obtained a positive reaction when the patient did not have the disease, or else had had a pertussis infection or a history of pertussis within four years. Our results lead us to the opinion that the complement deviation test is of the greatest value in the diagnosis of whooping-cough. With the method used it has been possible to make a diagnosis of pertussis in the catarrhal stage.

DISCUSSION.

DR. ROWLAND G. FREEMAN, New York, said that his work seemed very promising, but the general impression seemed to be that we were still uncertain as to whether we had really found the specific organism of whooping-cough. In one laboratory in New York they had been experimenting all winter with no results.

DR. CHARLES GILMORE KERLEY, New York, said that he had had the opportunity last summer of meeting Dr. Freeman, of London, England., who had used the vaccines on 1,134 cases of pertussis, and in each case had established a control. He was rather vague as to the results, but thought that the vaccine probably did some good. He gave it in doses of 2,000,000 twice a week. Used in conjunction with the pneumococcus vaccines he thought it gave good results.

DR. SAMUEL S. ADAMS, Washington, D. C., said that it seemed to him that the point as to the value of this test hinged on the early diagnosis; usually before the doctor saw the child with whooping-cough it had become a menace to many. Was there a history of whooping-cough in these cases? A history of disturbed sleep was valuable, as this often appeared long before other symptoms. The child would sleep for an hour or so and then wake with a paroxysm of coughing, and would repeat this. It seemed that if this test was to be of value they must get the child before there was a distinct history of whooping-cough.

Dr. L. Emmett Holt, New York, called attention to the close correspondence in some cases between influenza and whooping-cough, which made it very desirable to differentiate these conditions bacteriologically. They had had much influenza in the Babies' Hospital during the past winter and took cultures from all the inmates of the institution, and found that a large proportion of them showed the presence of the influenza bacillus. The resident physician had all the symptoms of whooping-cough, but the influenza bacillus was isolated from his sputum. This close resemblance of whooping-cough to influenza in some cases might account for the negative result in the case reported in the series just presented.

Dr. Alfred Friedlander, Cincinnati, said that in reference to the question as to how long the children had been coughing—3 cases had been coughing three days, 3 four days; some a week, and some ten days. The cases were carefully selected. When a child showed any definite history of cough the test was made, and the normals had some cough. In some the diagnosis of influenza, according to Dr. Holt's statement, had been made. Dr. Friedlander did not think one could any longer question the specificity of the Bordet-Gengou bacillus. They had been using it in three strains and obtained a definite deviation of the complement in each. So far as the value of the vaccines is concerned, there is room for doubt. With relatively small doses one gets no results, and by using 6,000,000 one gets no bad effects.

ENDOCARDITIS IN CHILDREN.*

Dr. Floyd M. Crandall, New York, said it was not his purpose to present a systematic monograph on heart disease in children, but rather to record certain views reached after many years of observation and on the study of case histories of private patients, some of whom had been followed for many years. His general conclusion was that cardiac disease in private practice ran a considerably more favorable course than it did in hospital and dispensary practice. Dr. Crandall said that in selecting the title of his paper he was aware that in the graver forms of the disease the process was never limited to the endocardium alone, but that the pericardium and the myocardium were also involved. It was undoubtedly true that a certain amount of degeneration of the heart muscle occurred during the course of every acute febrile disease or intoxication. It seemed that a poison like that of rheumatism circulating in the blood might so irritate the sensitive myocardium as to cause the primary lesion in that membrane, rendering the designation endocarditis proper. The probability of grave myocarditis, however, must never be forgotten. Examinations for its detection should be frequent and careful, for upon it more than upon any other element depends the prognosis and much of the treatment. There are four symptoms particularly suggestive of muscle involvement. The earliest to appear is irregular heart action or palpitation, and usually this was the most distinctive symptom. Syncope was characteristic of decided myocarditis, particularly in diphtheria. In addition to these two symptoms, cyanosis and precordial distress were very suggestive of muscle involvement. One or more of these symptoms in conjunction with physical signs warrants us in believing that in addition to the endocardial disease we have also muscle involvement. In the later stages the occurrence of cyanosis and edema is of more grave significance in children than in adults. It is usually impossible in a young child to determine the condition of the heart muscle unless an examination can be made during sleep as well as during the waking hours. If anemia is found to be marked the prognosis may not be so grave, as relief of this symptom may directly mitigate the heart symptoms. A point of great interest has been the occasional rapidity of the development of the physical signs of endocarditis. Dr. Crandall had observed a loud endocardial murmur to develop within eighteen hours in a closely-watched case. It was a common statement that the severity of the case was not in proportion to the amount of sound heard on auscultation. If the murmurs were judged as they should be, in connection with other signs, then this statement was not wholly true. Other things being equal, it was difficult to believe that a loud, rasping murmur was not more serious than a soft, blowing one. The final course of these cardiac cases is of great interest and moment. The patient in which the disease begins before the age of twelve years has a very important period before him. The physician who ignores the gravity of a cardiac murmur and lightly says that the child will grow out of it, is taking almost a criminal risk. It is quite true that during this period some children do change for the better, but the unfortunate opposite, in his experience, has been the more frequent result. In general terms his experience led him to agree with Dunn, that the earlier the primary endocarditis occurred, the better was the ultimate prognosis, because of the more perfect adaptation of the child to the heart and the heart to the child. In the matter of prognosis, he was not willing to agree with the proposition that the number of murmurs was not to be taken into consideration. The patient with a mitral regurgitation alone, other things being equal, had a much better outlook than the one with a double mitral murmur, and vastly better than one with an aortic murmur. An aortic murmur was a very dangerous thing in a child, but fortunately aortic insufficiency was rare in children. The evil effect of anemia upon the child with cardiac murmur could scarcely be overestimated. It was a contributing factor to weakness and fatty degeneration of the heart muscle. The chlorotic type, common in girls over the age of fourteen, should be watched for and vigorously combated by proper hygiene and medication. While the sources of infection of acute rheumatism were still somewhat doubtful, the evidence against the tonsils was sufficiently strong to make it important that infected tonsils in rheumatic children should be removed, in fact more so than in any other constitutional type. The effect on growth and development of endocarditis had been of particular interest to him. There were certain of the more grave cases, particularly those of decided rheumatic tendency, that did not develop well. It had seemed that the constitutional tendency and the rheumatic involvement were often more important factors than the heart lesion.

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* This article will appear in full in Archives of Pediatrics.

The treatment of endocarditis divided itself into two distinct stages—the acute and the chronic condition. Dr. Crandall said he had become more and more impressed with the importance of absolute rest in the early stages. It was not sufficient to keep the child in bed during the febrile period alone. Six weeks was the shortest time that any endocardial case should be permitted to leave the bed. He preferred to place the time arbitrarily at two months. Two symptoms were of special value in determining this point, namely, the rapidity and the regularity of the heart's action. He did not consent to the child's leaving the bed until the pulse was well below 100 and was regular. The rapidity on exertion must, however, be looked upon with some judgment. A child who had been several weeks in bed was certain to show more rapidity of pulse than one who had been leading an active life, and it was often a question of how much importance should be attached to increased frequency of the pulse on first efforts if it continue regular. The management of the acute stage was comparatively simple, but later it was more difficult, as the question was usually one of judgment in the individual case. As to the exercise that might be permitted, the action of the heart under exercise was the most reliable guide. If it became irregular or unduly rapid, there should be no hesitation in forbidding the more strenuous exercises. In the management of this condition arbitrary rules might do more harm than good. In few other conditions was it more essential that we study the case and treat the patient rather than the disease.

DISCUSSION.

DR. HENRY DWIGHT CHAPIN, New York, said that one feature of these cases was the tendency to acute dilatation under great stress. In young athletes, who were under great strain, permanent damage was sometimes done. It was in line with the address of the president to mention that the physical directors of athletics were frequently ignorant of the dangers of undue stress. This was one of the places where the physician had a duty to the public; he should have more to say in regard to the strenuous exercises which our schools and colleges encourage.

DR. HENRY I. BOWDITCH, Boston, said he wished to bear out what Dr. Chapin had said and to emphasize the connection he had brought out in regard to Dr. Hamill's address. The child with a damaged heart did not have a fair chance in life; he needed the closest observation, and a committee to investigate this subject of athletics in the schools and colleges would be productive of good results. As one observed more closely it seemed that family history played a part in these cases of endocarditis. There were frequently other case of endocarditis in the same family, and it was also interesting to note its association with streptococcic infection of the tonsils.

Dr. Fritz B. Talbot, Boston, said that he had seen a case of endocarditis within the past few days in which the history showed that the sister had had rheumatism and endocarditis three weeks before. If the family history of these cases were studied more closely it would be found that there were often other cases in the same family. The statement was made that children in private practice had a better chance than the children of the poor. In our heart hospital in Boston the results have been good. Rest in bed for six weeks to two months seems to be rather too short a time for the majority of cases. In our work we are trying to see what a social worker can do in the matter of keeping these children in bed at home. Both hospital and home care under a social worker have been shown to be efficient, but it cannot yet be stated which is the better.

Dr. J. P. Crozer Griffith, Philadelphia, said that Dr. Crandall had spoken of the increase in the rapidity and of irregularity on getting up as an indication that the patient should remain in bed. It was possible that where there was a certain degree of debility the patient might be kept in bed longer than he should be. These patients might be divided into three classes: (1) A small class where there was absolute failure of compensation. (2) A large class which respond well to treatment, and in which recovery usually follows. (3) A class in which there was a tendency to anemia which did not yield readily to treatment. These were the cases in which the anemia did not yield readily to arsenic, etc., but that continued to be discouraging.

Dr. A. D. Blackader, Montreal, said that the speaker had referred to the effect of rheumatic endocarditis on the development of the child. This was a point that had interested him. It had been pointed out that growth was dependent on wide arteries and low blood pressure; a slight endocarditis by lowering the blood pressure and favoring wider arteries favored an increase in growth, and these children might be found a little taller than other children in the family. Another point not mentioned in the text-books was the advantage of giving small doses of potassium iodid in these cases of endocarditis in children. When the temperature became normal small doses of potassium iodid might be given for three, four or five weeks. Its effects on acidosis were well known, and it is believed to have some effect on the viscosity of the blood. In regard to the after treatment in cases in which endocarditis had developed, this must be a matter of judgment. In many cases with slight lesions the children may go ahead without much effect on the pulse or breathing and without much thought of the heart Such mild lesions were usually confined to the mitral valve. Excepting for the strenuous exercises, such children during the period of their general development should be permitted to develop their hearts as well as the remainder of the body.

Dr. Henry L. Coit, Newark, N. J., said that Dr. Crandall spoke of keeping these children in bed six or eight weeks and that they might get up when the pulse was 100 or less. The susceptibility of the pulse in children made it important to know whether he meant 100 standing or recumbent.

Dr. Isaac Abt, Chicago, said that Dr. Crandall spoke of the rarity of aortic lesions in children. Aortic lesions were not as rare as had been supposed; in his experience he was seeing an increasing number of these cases. Occasionally in children with murmurs there was slight temporary cardiac dilatation after exercise, perhaps lasting for a period of days. What should one do in regard to exercise in these cases? It was very difficult to keep a boy in this condition in bed, and there was no absolute rule that could be laid down. It was really a matter of what was best for the individual case; if there was considerable dilatation of course one should be careful.

Dr. Rowland G. Freeman, New York, said that no one had spoken of the value of the X-ray in the control of cases of endocarditis. Cases that showed great enlargement should be subjected to an X-ray examination when they showed an improvement in symptoms. In a case that came under his observation there seemed to be an improvement and the child was permitted to get up. The child then ran a temperature and a second X-ray showed that the condition was worse than when the first examination was made.

Dr. D. J. Milton Miller, Atlantic City, N. J., said that there were a small number of children with adventitious murmurs not due to endocarditis, but which were exceedingly difficult to diagnose. The child might be delicate and have a cardiac murmur at the base or sometimes at the apex and it was difficult to satisfy one's self as to the nature of the murmur. These cases were frequently let go without treatment and sometimes disastrously. In endocarditis in children small doses of morphin were valuable.

Dr. Percival Eaton, Pittsburgh, Pa., said that Dr. Crandall had touched a little on anemia, and he would like to suggest the longer administration of iron as a help in this condition. In many cases the heart could be trained to meet the needs of the child. One was apt to forget how much could be done by beginning with a little exercise and very gradually increasing it.

Dr. Henry I. Bowditch said that he recalled a case in which the inheritance or family predisposition was very interesting. A mother had endocarditis. The oldest son of her first daughter also had it. The second daughter had a marked endocarditis and her oldest child had two attacks, probably due to infection through the tonsils. A third daughter showed no symptoms of the condition, but her eldest son had an endocarditis, probably also an infection from the tonsils. Dr. Bowditch said he did not know what the predisposition of the grandchildren had to do with the development of the endocarditis, but he felt that it had something to do with it.

Dr. Frank S. Churchill, Chicago, asked if the blood pressure was taken in these cases and what it was, whether it was different in the organic and the functional murmurs, whether it was less when lying down than when sitting, and less when sitting than when standing, whether on lying down the murmur was transmitted to the axilla. These were questions it would be interesting to have answered. One could get around the prolonged rest in bed by giving passive exercises. The question of allowing the child up when the pulse was 100 or less depended on the age of the child and the blood pressure.

Dr. L. E. La Fétra, New York, said that the family tendency to endocarditis might be explained by the tendency of the lymphoid tissue to infection being handed down from one generation to another. It seemed to him that the blood pressure could be used as a guide along with the pulse rate to determine when one might allow the patient out of bed. Often after exercise for the first two or three days after the child was out of bed the heart would be rapid, but after several days the heart got its second wind, so to speak, and then went along all right.

Dr. Herbert B. Wilcox, New York, said that the anemia in these cases was the one thing amenable to treatment. One should get the children with endocarditis into the country. They had a hospital in the country and last summer sent a number of children with severe lesions to it. They were kept under observation by a member of the staff and received no treatment other than careful hygienic supervision. Only one of these children returned to the clinic for treatment. Most of them were permanently improved by this method. This also threw some light on why the results in these cases were better in the families of the well-to-do than among the poor.

Dr. Floyd M. Crandall, New York, said that many children with endocarditis if kept in bed too long developed hospitalism. It was not well to center the child's mind on the condition of his heart. He often made the excuse that he was examining for a cough when he was observing the heart. In connection with the relation of a family history of rheumatism to the endocarditis in these cases, Dr. Crandall recalled a family of seventeen cousins who came to his notice at the Polyclinic Hospital, in which every one of them had either chorea, endocarditis, or rheumatism.

THE TREATMENT OF RECURRENT SIBILANT BRONCHITIS.*

Dr. B. K. Rachford, Cincinnati, expressed the belief that the symptom groups commonly described in the literature under the titles migraine, recurrent vomiting, recurrent sibilant bronchitis, recurrent coryza, asthma and urticaria, as they occurred in children, were, as a rule, closely allied food intoxications which could be successfully treated by very much the same medical and dietetic treatment. The object of this paper was: (1) To call attention to the clinical fact that recurrent rhinitis and recurrent sibilant bronchitis, which were sometimes associated with severe asthmatic attacks, and almost always with a severe paroxysmal cough, were very commonly caused by some kind of food intoxication. (2) That these recurrent attacks of rhinitis and whistling bronchitis, which was one of the most common symptom groups the physician was called upon to treat, might in most instances be almost or quite relieved by dietetic treatment. (3)

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* This article will appear in full in Archives of Pediatrics.

To insist that this symptom group occurred not infrequently in children who had a predisposition to migraine, recurrent vomiting and urticaria.

During the attack of recurrent rhinitis and recurrent sibilant bronchitis and asthma, sweets, fats, eggs and raw fruits were especially to be avoided. Strawberries, rhubarb, tomatoes, salads, shellfish, tea, coffee, pastry, gravies, cream, cod-liver oil and alcohol were excluded from the diet. Saccharin might be used instead of sugar, and while the patient could not have butter, skimmed milk might be allowed. Eggs in every form, even in cooked foods, were to be eliminated. The following foods might be permitted: Beef, mutton, fowl and fish in moderation, cereals, bread, all vegetables not above proscribed, cooked fruits, skimmed milk and thick soups. About two months after the patient has recovered from the attack the above diet may be carefully modified by adding one egg a day; then perhaps two weeks later milk containing 4 per cent. fat. Some few weeks later small quantities of sugar may be added to cereals or cooked fruits. After five or six months the child may return to his original diet. The patient should have all the out-door air possible, and when he recovers from his attack exercise in the open air is advisable. During the attack constipation should be relieved by some magnesium salts. Alkalies in the form of bicarbonate of soda, bicarbonate of potash or citrate of potash should be given in fair-sized doses three or four times a day. Bicarbonate of soda may be given in 5-grain capsules three or four times a day, or the same sized dose of citrate of potash may be given in solution. In younger children a teaspoonful of citrate of potash may be distributed through the food. Tincture of belladonna should be given for a short time in two to four minim doses three times a day. In the intervals the belladonna is discontinued, but an alkali of some form should be given for six or eight weeks. Bicarbonate was best for this purpose. In the adult and older children the following prescription, which Dr. Rachford originated twenty years ago, he still used: Sodii sulphatis (dry), 30 grains; sodii salicylate (from wintergreen), 10 grains; magnesii sulphatis, 50 grains; lithil benzoatis, 5 grains; tincture nucis vomicæ, 3 drops; aquæ distil. to make 4 ounces. This prescription was put up in siphons and charged with carbonic acid, and the patient was directed to take, one-half hour before breakfast, a quantity sufficient to produce at least one bowel movement during the day. This prescription was of great value in the prevention of migraine and, in fact, might replace all other medication in that condition.

DISCUSSION.

Dr. Percival J. Eaton, Pittsburgh, said he understood from the paper that Dr. Rachford referred to that form of bronchitis in which there were sibilant râles mixed with so-called asthmatic râles. Last year he had seen about 10 of these cases, and during the past winter he had seen from 90 to 100, but he had no suspicion that they were dietetic in origin. He felt that an element had come which he had not seen before. They had been using urotropin in these cases and found that it acted very quickly. He had seen these cases in nurslings and in children of all ages up to seven or eight years; the majority, however, were in infants from six months to two years of age. These cases were new to them in Western Pennsylvania and Ohio, whether they were due to infection or to diet, though to him the latter was a new idea.

Dr. Fritz B. Talbot, Boston, said that Dr. Schloss had given the answer as to the cause of this condition in his excellent paper read before the New York Academy of Medicine about two years ago on "Egg Anaphylaxis." In a case of egg anaphylaxis and asthma that came under his attention, when immunity was effected to egg the asthma also was cured. It seemed to Dr. Talbot that this was a question of anaphylaxis. There might be anaphylaxis to other articles of diet besides eggs. In one patient, who had an anaphylaxis to egg associated with a sibilant bronchitis, he started in with one sixty-fourth of a grain of egg in capsule, and even this small dose produced a reaction every time it was administered.

Dr. Godfrey R. Pisek, New York, said that according to what the doctors had been saying Dr. Rachford's treatment was palliative; the real treatment must reach the causative factor. It was not sufficient to stop egg alone, one must stop all foods containing egg as well. Some foods, such as acid foods, brought out an intolerance for certain other foods, and each case must be studied from the individual standpoint.

Dr. Henry L. Coit, Newark, N. J., said that many cases showing an anaphylaxis for egg had also an anaphylaxis for macaroni. The following case seemed to be in line with what Dr. Rachford had just said. This was a case in which it was necessary to transfer a child from milk to a diet in which the carbohydrates would be in the form of starch and cereal. One teaspoonful of wheat jelly was given and caused a rise in temperature, vomiting and prostration. He urged the mother to try the wheat jelly again. This she did and the result was again disastrous. After two weeks the experiment was repeated and there was a recurrence of the vomiting and prostration. He then attempted to overcome the anaphylaxis by vaccinating the child with a minute quantity of the wheat jelly. The child now took cereal jelly and vegetables.

Dr. Walter Lester Carr, New York, said he would like to endorse Dr. Rachford's paper. Many of the children referred to in this paper were susceptible to infection, especially to the influenza bacillus; they belonged to the so-called lithemic type and one frequently found them with deviated septum, enlarged tonsils, etc. One child that had come under his observation could ride on a pony without any inconvenience, but had an attack of asthma if he went into the stable. The children having the instability did better if starved, as in enteritis. They might be given either skimmed milk or lactic acid skimmed milk, and should have general dietetic management.

Dr. Isaac A. Abt, Chicago, said that during the reading of the paper he was reminded of the description given under the name of "exudative diathesis," a condition in which there was a predisposing constitutional state associated with certain definite symptoms. Under this term Czerny included exudative inflammatory conditions which might manifest themselves as eczema, scrofula, recurrent bronchitis, asthma, urticaria, etc. The symptoms might become more pronounced after eating eggs and milk, or after mild infection. One must not consider this predisposition a simple anaphylaxis. Children who do not tolerate milk and eggs frequently tolerate starches well and may detoxicate, after taking too much milk or eggs, on starches.

Dr. Charles Gilmore Kerley, New York, said that he had read a similar paper before the Medical Society of the State of New York* and had given Dr. Rachford the credit of priority.

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* This article will appear in full in Archives of Pediatrics.

At that time he had presented 6 cases of children affected with recurrent bronchitis and 3 with recurrent bronchitis associated with asthma. These conditions were different from infectious colds; children did not get infectious colds so often. The children might have an infection, but the colds were not infectious, *per se,* but were always associated with a lithemic, rheumatic, or gouty history. In these conditions the carbohydrates were at fault, the children were relieved by the elimination of sugar and fat from the diet, and most of them gained in weight. The necessary amount of carbohydrate could be obtained from the ordinary starches and vegetables. Cream was forbidden. Milk, being a highly energized form of food, was allowed only in small quantities, one pint of skimmed milk a day being all that was permitted. In addition to the dietetic treatment citrate of soda was given and the bowels kept open by a suitable laxative. There had been some failures, in a number of instances, because the treatment was not properly carried out, but the majority of cases were benefited by this scheme of treatment.

Dr. Samuel S. Adams, Washington, D. C., said that it seemed to him that this was a question of simple idiosyncrasy; they had all known cases of idiosyncrasy to strawberries, quinin, to shellfish, etc. The problem was to find the article of food for which the idiosyncrasy existed and to eliminate it. In these cases, instead of seeking the scientific and the mysterious one should get back to first principles and eliminate that article of food from the diet that was causing the trouble.

Dr. D. J. Milton Miller, Atlantic City, said that in some instances there seemed to be some factor other than food which was involved in these cases. Some children could not live at the seashore because of external manifestations of irritation, but as soon as they went to the mountains they were all right.

Dr. John Ruhräh, Baltimore, said it seemed to him that they were confusing two things—anaphylaxis and acid intoxication.

Dr. Percival J. Eaton, Pittsburgh, said his cases were breast fed and anaphylaxis did not come in. He had had under observation children who could not take egg and wherever egg struck the skin of the hands or face there was a red spot produced. The cases to which he had referred in his previous remarks were probably not those to which Dr. Rachford referred;

they were acute infections, probably influenza or streptococcic infections.

Dr. B. K. Rachford, Cincinnati, said the question of alkalinity had just been mentioned. In his paper he had called attention to the fact that magnesium salts helped to fix the alkali in the tissues. The alkalinity was better kept up when soda and magnesia were combined. Dr. Pisek had referred to his treatment as palliative rather than curative. One might not always be certain of the cause of the trouble, but these cases responded almost immediately to the alkalin treatment. This was continued and the dieting kept up and after a time one could begin experimenting with foods. When the point was reached where one of the food stuffs caused a return of the symptoms, that article must be eliminated for a time or permanently. In the paper he had avoided the term anaphylaxis, and the etiologic and predisposing factors purposely.

THE CLINICAL STUDY OF TYPHOID FEVER IN CHILDREN.

Dr. Henry Dwight Chapin, New York, said that children had been supposed not to be very susceptible to typhoid fever, and, when affected, were apt to exhibit an irregular type of the disease; these facts rendered a study of cases of value for future reference. It was during epidemics that children were most likely to be attacked, and during the fall of 1913 an epidemic of typhoid fever occurred on the lower East Side of New York City, including 521 reported cases, with a mortality of 11.7 per cent. Many children were attacked; a little over three-fifths of all the cases in the epidemic were in children under fourteen years of age. Dr. Osler, in reporting on 1,500 cases of typhoid fever in Johns Hopkins, stated that 231 were under fifteen years of age. Dr. Ogan, of the New York City Board of Health, in a study of 1,500 cases for comparison with those of Dr. Osler, found 437 cases under fourteen years of age. Children under twelve years of age constituted one-fourth of the population of New York City and approximately one-fourth of all cases of typhoid fever occurred in children under twelve years of age, so that children contributed their fair ratio to this disease. It was evident that they would have to revise their ideas as to the frequency of typhoid fever in children. The 11 cases here reported occurred during this epidemic and were treated in the Post-Graduate Hospital. The ages were as follows: Two were two years of age; 2 were three; 2 were four, and 2 were five years of age; 3 were six years of age, and 1 was eight years of age. The duration of the fever, including the period before admission, was very varied, ranging from eleven to forty-two days. In only 5 cases did the temperature run very high during the active stage; 2 reached 106°F.; 1, 105°F., and 2 ranged from 104° to 105° F. In the other cases the temperatures were not high and were distinctly remittent toward the close of the disease. The diagnosis was confirmed in every instance by a positive Widal test and no case showed any rose spots. There was no appreciable diminution of the leukocytes except in 1 case, in which they numbered only 4,200. These cases thus failed to show the leukopenia that was supposed to accompany typhoid fever. A study of the polymorphonuclears showed what, considering the age of the patients, might be considered a polynucleosis. The lymphocyte count was irregular, being normal in only 1 case. A study of the urine showed that the kidneys were not much affected in this series. The gastrointestinal symptoms were neither marked nor severe. Vomiting was noted at the onset in 4 cases, diarrhea in 5, constipation in 5, and 1 showed no abnormality. The children seemed both to enjoy and to digest the generous diet that was given them. They were allowed the general ward diet, with the exception of meat. This included milk, cocoa, eggs, bread, toast, crackers, cereals, jelly, potatoes, gravy, broths, custards, junket, apple-sauce, orange-juice, ice-cream and lady fingers. Nourishment was administered every three hours. An effort was made to give 40 calories per kilo body weight per day, but in not a single instance had it been possible to make them take the full required number of calories through the febrile stage. In some instances sugar of milk and malt sugar was added to the liquids in order to increase the total caloric value of the food, but this also failed, since the children refused to take it. Of the 11 cases, 7 gained in weight during the fever, 2 showed a slight loss, and 2 an appreciable loss. The most remarkable case occurred in a child of three years, who showed a gain of 8 pounds after a fever lasting nineteen days. There were no severe complications and no relapses. Under the former might be noted 2 cases of tonsillitis, 2 of otitis media, 1 of hypostatic pneumonia, 1 of pyelitis, and 1 of severe bronchitis.

Without a knowledge of the epidemic it was doubtful if most of these cases would have been diagnosed. In no case was the spleen palpable.

DISCUSSION.

Dr. L. Emmett Holt, New York, asked how long the patients remained in the house or how long was their residence in the hospital.

Dr. Chapin replied that they remained three or four weeks.

Dr. Samuel S. Adams, Washington, said that in an analysis of 550 cases in the Children's Hospital, under Dr. Acker, it was found that the children were taking about all the foods that Dr. Chapin had mentioned and that there were fewer cases of intestinal hemorrhage under this method of feeding than under the older methods. Some doubt had been expressed as to the occurrence of typhoid fever in children under the age of two years, but he had seen infants and very young children with typical attacks of typhoid fever. One point in favor of the modern method of feeding was the absence of wailing and crying for food; the children were never hungry. Typhoid fever had never been a rare disease in the District of Columbia and it had long been recognized in children, McPherson having observed it in the seventies and they having seen typical attacks in infants five and six months old.

Dr. L. E. La Fétra, New York, said he had a paper on this subject, but wished to say a word about the calories. Dr. Chapin had said that he had had difficulty in getting the children to take the 40 calories per kilo body weight; in their work they found that after a few days 40 or 50 calories were readily taken, and sometimes two or three times that amount were taken with benefit.

Dr. Abraham Jacobi, New York, said that there were a few cases of typhoid fever in newly-born and very young infants. He recalled one case, in an infant fifteen days old, which he saw thirty-five years ago. At autopsy ulcers of Peyer's patches were found. That the latter were sometimes not apparent was due to the fact that Peyer's patches were not so well developed in young infants. He had heard of several similar cases, and perhaps those who were in hospitals that admitted young babies had seen them. They should not forget the work Dr. Coleman had done to put their doubts as to the value of the high caloric diet in typhoid fever farther and farther away.

CIRCUMCISION IN MASTURBATION IN FEMALE INFANTS.

DR. ROWLAND G. FREEMAN, New York, stated that masturbation in female infants occurred with moderate frequency and if neglected led to a considerable amount of depravity. It might be controlled by proper treatment. In the female infant there existed fairly regularly marked adhesions between the clitoris and the surrounding tissues so that on examination the clitoris was frequently found buried in these adhesions. In a normal, robust child they seemed to cause little irritation, but in the nervous, sensitive child they might cause intense irritation and might lead to the formation of a habit which might become permanent and exert an injurious influence over the future development of the child. The treatment of this condition was both general and local. The general health should be improved by hygienic measures and all sources of nervous irritability and excitement removed. The only curative treatment, however, was that applied to the removal of the sources of irritation, the adhesions of the clitoris. The only satisfactory method of treating these adhesions was by circumcision, an operation which should be performed by one accustomed to doing it, the foreskin being removed as completely as possible. The result of the operation was most satisfactory. In many cases recurrence of the habit was noticed and was usually found to be due to a recurrence of the adhesions, which might in such cases have to be removed a second, or even a third, time. A number of illustrative cases were cited, in several of which removal of the adenoids at the same time was a factor in improving the general condition and effecting a cure.

DISCUSSION.

DR. ABRAHAM JACOBI, New York, said he would like to ask Dr. Freeman if he thought every case of masturbation in a female infant was due to adhesions of the clitoris, that was, to an anatomical anomaly.

DR. ROWLAND FREEMAN said that all the cases he had seen were due to such causes.

Dr. Abraham Jacobi, New York, said that this paper was a revelation to him in that it showed a new cause of masturbation in female infants. He referred to the many causes which might cause irritation leading to this habit. Such irritation might be caused by constipation; by fissure of the anus; the presence of oxyuris; by vaginal catarrh, which in many cases was the result of uncleanliness and neglect; by an oxyuris travelling up into the vagina and setting up irritation: by a cystitis, though this was not common; by a pyelitis, now recognized very frequently, whereas twelve or fifteen years ago it was considered very unusual; by stone in the kidney, which might be the cause of peripheral irritation, and this was by no means a rare condition in infants. There were so many causes that might lead to masturbation that Dr. Jacobi said he was glad to know if there was another, for which he must watch. In his experience masturbation was a disease very frequent before the end of the first year and it might last for years.

INFANTILE SCORBUTUS AND THE PASTEURIZATION OF MILK.

Dr. John Lovett Morse, Boston, said that in a paper published in the *Boston Medical and Surgical Journal,* April 2, 1914, he had called attention to the rapid and progressive increase in the number of cases of scorbutus coming to the Medical Out-Patient Department of the Children's Hospital during the last four years, ending in 1913, and to the coincident increase in the amount of pasteurized milk used in Boston during this period. A table showing the number of new cases coming to the hospital, the number of cases of scurvy, the percentage of scurvy, and the percentage using pasteurized milk, showed that while in 1904, among 2,579 new cases coming to the hospital, there were 3 cases of scurvy, or a percentage of 0.11, in the year 1913, among 2,416 cases coming to the hospital, there were 21 cases of scurvy, or 0.87 per cent. The records of 1914 showed that thus far this year the high percentage of cases of scorbutus had been maintained. The increase during the past five years over the previous year since 1904 was especially marked. A study of the table showed that a much smaller proportion of the cases afflicted with scurvy in 1913 were fed on proprietary foods than was the case ten years ago. The table showing the food which these babies were taking in 1914 showed that the modifications were all reasonable ones. There could be little doubt, judging from the figures, that there had been an actual increase in the number of cases of scurvy in Boston during recent years. It was not proved, however, that this increase had been due to the introduction and progressive use of commercial pasteurized milk. Neither did they prove that the heating of the milk, whether to a temperature of pasteurization or boiling, had anything to do with the etiology of scurvy. They did suggest, however, that there might be some connection, and seemed to justify further study along these lines.

DISCUSSION.

Dr. Henry John Gerstenberger, Cleveland, asked Dr. Morse what his results were in treating these cases, especially if any change was made in the quality or the heating of the milk, and what he did in regard to the feeding of orange juice. He said he had had a case of scurvy that developed on casein milk and he simply added orange juice without changing the milk and the child improved rapidly.

Dr. D. J. Milton Miller, Atlantic City, N. J., stated that Dr. Morse's contention that scurvy was on the increase corresponded with his personal experience. He had seen 12 cases in private practice during the past two years. A few years ago Dr. Northrup, in speaking on this subject, raised the point that scurvy was frequently not recognized by the average practitioner. A number of years ago they were very much alive to it and saw the condition frequently, but since that time they seemed to have forgotten all about it. Now that attention had again been attracted to it more cases were being recognized. In 5 of the cases coming under his observation there was a history of bi-pasteurization of milk. The mothers had pasteurized milk that had already been pasteurized. Dr. Miller said he would like to call attention to the fact that in the history of his life in the Arctic region Stapleton related that when the supply of fat gave out lean meat failed to satisfy the appetites of the men and they developed scurvy, but as soon as a supply of fat was obtained the ravenous appetites again became normal and the scurvy disappeared. This seemed to indicate that the lack of a properly-balanced diet might be a factor in the causation of scurvy.

Dr. A. D. Blackader, Montreal, said that his experience in

Montreal was similar to that of Dr. Morse in Boston. He had seen an increasing number of cases of scurvy, especially during the last winter. He had not altered the food, but simply added orange juice.

Dr. William P. Northrup, New York, said that in the paper to which Dr. Morse referred he had emphasized the fact that often pasteurized milk was given another boil by the lady of the house. The newer practitioners did not know scurvy as did the older ones.

Dr. Isaac A. Abt, Chicago, referred to certain experiments on animals as being interesting in connection with the etiology of scurvy. Pigeons fed on cereals developed polyneuritis; guinea pigs fed on cereals developed scurvy; guinea pigs fed on raw milk had extra brittle bones; some fed on milk heated at a temperature of 60° to 112° C. got scurvy, and those fed on oatmeal and raw milk did not get the disease. Milk heated to 90°C. to which oatmeal was added showed antiscorbutic properties. This brought out the question whether cereals could be considered a factor in the production of scurvy.

Dr. Floyd M. Crandall, New York, said that the present supposed increase in the number of cases of scurvy might be due to the fact that the present generation of physicians was not as alive to the disease as the former one. This subject was formerly a very popular one in medical literature for a time. It was a surprise to him that so little had been written on the subject in recent years.

Dr. Thomas S. Southworth, New York, said he wished to call attention to the fact that while the practice of using pasteurized milk had become very common, it was also true that the custom of giving orange juice had become very prevalent during the past twenty years, so that it was a question whether we should have an increase in the number of cases of scurvy with this habit.

Dr. Rowland G. Freeman, New York, said that in New York City the Board of Health had prohibited the use of raw milk almost entirely, so that practically all the milk used in the city was pasteurized, yet he had not seen a case of scurvy all winter.

Dr. Godfrey R. Pisek, New York, said he would like to confirm what Dr. Freeman had just said. He had not seen a case of scurvy this past year. He wondered if the form of pasteurization had anything to do with the production of scurvy. Dr. Morse had not referred to the effects of artificial foods.

Dr. Henry Heiman, New York, said he also would like to confirm what had been said in regard to scurvy in New York City. He had not seen a case of scurvy recently. He believed the disease was not due so much to pasteurized milk as to artificial foods; the disease was a form of food poisoning. He had seen scurvy with pasteurized milk and equally as much with other forms of feeding.

Dr. J. P. Crozer Griffith, Philadelphia, called attention to an investigation of this subject by a special committee. This committee had found that there was nothing wrong with the food, but that was about as far as they got In many cases what was needed was a change of food, but in what that change consisted they could not predicate anything definite. Ten cases occurred in infants that were breast fed, and what was wrong no one knew. Cases that had developed scurvy on raw milk sometimes got well on modified milk. They were not yet in a position to blame pasteurized milk, or sterilized milk, or any other food. It was noticed ten years ago that babies got scurvy when fed on prepared foods, just as they do to-day on pasteurized milk. Now proprietary foods were not so much used and the only constant factor was the commercial pasteurized milk.

Dr. Samuel McC. Hamill, Philadelphia, asked Dr. Morse if he knew the temperature at which the milk was pasteurized in these cases of scurvy. They should be careful in regard to their statements about pasteurized milk when it was so necessary to pasteurize the milk in order to protect children.

Dr. John Lovett Morse, Boston, said that the milk had been pasteurized in different ways in these cases of scurvy and perhaps some of it was not pasteurized. All the children were given orange juice; sometimes they did not change the food, but stopped heating it. With regard to the failure of physicians to recognize the disease, they certainly ought to know as much about it as formerly; much attention was paid to this subject at Harvard. Dr. Morse said he could not understand the difference in the frequency of the condition in New York and in Boston. He did not make any claim that heating the milk was the cause of scurvy, but said that this might be a possible explanation. There was nothing in the evidence that pasteurization had any effect on the nutrition, yet here were the figures and there was something they had not explained, either theoretically or practically.

EXPERIENCES WITH THE HIGH CALORIC DIET IN TYPHOID FEVER OF INFANTS AND YOUNG CHILDREN.

Dr. L. E. La Fétra, New York, first discussed the reasons why the feeding of a high caloric diet in typhoid fever was the logical procedure, and stated that the object of the carbohydrate diet was twofold—physiologically, to provide the patient with a readily assimilable food requiring a minimal amount of digestive energy to prepare it for the tissue needs; and bacteriologically, to shift bacterial metabolism from the destruction of the body tissue for their food requirements to the utilization of carbohydrate for at least the major part of their dietary needs. This did not result in the annihilation of the invading bacteria, but it certainly approached their metabolic reformation. Inasmuch as no metabolic studies had been made upon children suffering from typhoid fever they knew of no standard for the daily protein ration in children. In their series no attempt was made to have either an upper or a lower limit of protein, but the general rule was adhered to, to have the protein calories not less than 7 nor more than 15 per cent. of the total number of calories given. The routine treatment was sponge baths for a temperature of 103.5°F. The patients were kept on balconies or in rooms with open windows. Typhoid vaccines were given in 7 cases, but seemed to have no influence on the course of the disease. In general the children were fed at three-hour intervals. The articles given were much the same as those prescribed for a child in health, with the exception that the only meat used was creamed chicken. In order to increase the caloric value of the liquid food, which was practically always milk, lactose and cocoa and usually cream were added. In no case was the exclusive milk diet used. Eggs and toast were offered from the beginning, and it was largely a matter of the nurse's tact and encouragement how soon the high caloric diet would be taken. The number of calories that were actually taken after the first few days, and that seemed, from a clinical standpoint, to have been satisfactorily utilized, varied from 100 to 300 calories per kilo. Unless nervous toxic symptoms were present, the fever did not prevent the taking of a generous diet; as the temperature fell, however, the amount of food taken was increased.

The series comprised 48 cases. The diagnosis was established by positive Widal reaction in 44 cases and by positive blood culture in 36 cases. In only 1 case was there found neither a positive Widal nor a positive blood culture. The ages of the children were as follows: Under two years, 1; from two to six years, 21; from seven to twelve years, 26. The length of time in the hospital averaged twenty-eight days. The extremes were fifteen and fifty-eight days. The general condition of the patients was remarkably good. The so-called typhoid state occurred in a much smaller proportion of cases than by the old methods of treatment. Abdominal distention was present in only 6 cases, and in only 1 of these was it severe or troublesome. Five of the patients had blood in the stools some time during the course of the disease; in only 2 of the cases were the hemorrhages severe enough to cause any apprehension. In both blood transfusion was done by the Lindemann method and each time with signal benefit. One patient, who was transfused three times and who lost the most weight, took during convalescence the largest number of calories that we have seen recorded, viz., 8,000 in twenty-four hours. Thirteen patients were irrational in the early part of the disease. There was not the slightest doubt but that most of severe nervous symptoms noticed in the late stage of the disease heretofore were due to starvation and the consequent increase in toxemia. Pneumonia and bronchopneumonia complicated 3 cases, and in the only death that occurred it was proved at autopsy that the fatal issue was due to pneumonia. There were but three relapses and one recrudescence, or a little over 8 per cent. During the course of the fever 60 per cent. of the patients gained weight. This was the most remarkable fact about this series. The high caloric diet prevented the loss of weight hitherto so marked throughout the course of the disease. If one considered the weights of the patients at the time of leaving the hospital, 92 per cent. gained in weight during their stay.

DISCUSSION.

Dr. Henry Dwight Chapin, New York, asked what was the strength of the cream used.

Dr. La Fétra replied that they had used 20 per cent. cream.

Dr. Frank S. Churchill, Chicago, said he had understood from the paper that there were 5 cases in which there was blood in the stools, and he wondered if there was any connection between the hemorrhage and the high caloric diet.

Dr. Charles Gilmore Kerley, New York, said that during an attack of typhoid fever a few years ago he was given a very meagre diet and he felt that he was entitled to more, and since that time he had allowed his patients a more liberal diet in typhoid fever, as his writings on this subject had shown. The diet he used was very similar to the one just described, except that he had not been allowing meat until the third week. One found much less tympanites after getting away from the milk diet; an exclusive milk diet was the chief means of producing tympanites.

Dr. John Lovett Morse, Boston, said he had had an attack of typhoid fever twelve years ago and had learned his lesson, and since had given typhoid fever patients a more liberal diet. With a generous diet one did not get the constipated stools that occurred with the milk diet. Dr. Morse said they were feeding their typhoid fever cases a diet very much like that described by the essayist and they tried to keep the calories up as high as Dr. La Fétra did. As it was difficult to give the high caloric diet during the febrile stage it seemed that it was desirable to divide this subject of feeding into two stages—febrile and post febrile.

Dr. L. E. La Fétra, New York, said that in reference to the question as to the relation of the high caloric diet to hemorrhage, the diet was not very high in calories at the time of the hemorrhage. When the children were very sick and had a high temperature they did not take very much food. In one boy with hemorrhage he had urged as much food as the patient could take when his temperature was 103°F. Dr. Morse was right in stating that a distinction should be made between the two periods in relation to the diet.

THE GASEOUS METABOLISM OF INFANTS.

Dr. Francis Benedict and Dr. Fritz B. Talbot, Boston, gave a complete historical review of all the literature on the gaseous exchange and calorimetry of infants, which was followed by a presentation of the important problems in this field. Their chief aim was to study the metabolism of normal infants under conditions approximating the ideal, the infants to be selected, first, with varying ages; second, with varying weights, and, third, of both sexes. A respiration apparatus, measuring simultaneously carbon-dioxide production and oxygen consumption and provided with a sensitive arrangement for registering automatically and graphically the slightest body movement, was used to study 58 infants during approximately 1,000 periods of observation. Continuous pulse records and a graphic registration of the degree of muscular repose enabled many important correlations with the respiratory studies.

A series of twelve-hour continuous pulse records, accompanied by ocular observations of the degree of repose, showed a sudden and considerable increase of the pulse rate with crying or nursing and a rapid return to the low level with cessation of crying and feeding.

A comparison of the pulse rate with the muscular activity as determined by the kymograph records of the swinging crib showed invariably a close agreement. The metabolism also increased or decreased as the pulse rate and activity increased or decreased. Distinct evidence of an increased pulse rate and metabolism independent of external activity was interpreted as being an indication of internal work and suggested the pulse rate as an indication of this internal work. There were, however, a sufficient number of well-defined instances of alterations in the pulse rate unaccompanied by changes in the muscular activity to justify the assumption that an increased pulse rate was not necessarily a result of extraneous activity.

Particular stress was laid on the comparative study of the basal metabolism of the infants, *i.e.*, the metabolism during complete muscular repose as shown by the kymograph records. Under these conditions it was found that, while in general the smaller the infant the smaller the total metabolism, there were a sufficient number of exceptions to prevent the formulation of a definite law. Similarly there was no striking uniformity in the metabolism per kilogram of body weight, although with "normal" children the plotted chart gave indications of an approximately regular line. As many of the infants were under weight, the total metabolism was compared with the normal weight for the age, but no approach to uniformity or regularity was apparent.

Hoobler and Murlin had duplicated their experiments and, although their observations included but two atrophic infants, it was gratifying that they reported that their findings were in full accord with these.

A discussion of the supposed relationship between body surface and metabolism and a critique of the methods used for measuring body surface introduced the discussion of the values found with these infants. No relationship was found between the age of the infants and the heat produced per square meter of body surface, nor could any relationship be noted between the heat production per square meter of body surface and the actual body weight, the normal weight for the age, or the expected body weight.

Evidence secured with normal and atrophic infants of different ages and weights was presented to show that the active mass of protoplasmic tissue determined the heat production. This active mass of protoplasmic tissue might be stimulated to a greater or less cellular activity, the intensity of the stimulus being indicated by the pulse rate.

THE CALORIC VALUE OF THE DIETS OF SICK INFANTS.*

Dr. J. C. Gittings, Philadelphia, said that in the course of a careful reconsideration of cases seen in the infant wards during his service at the Children's Hospital for the past three years it had seemed desirable to measure and tabulate the nutritive value of the various dietaries in order to get a comprehensive view of his feeding methods. In computing the caloric requirements for the various weights in the table, the factors used were the highest figures in the tables, viz.: First three months, 50 calories; three to six months, 45 calories; six to twelve months, 40 calories; twelve to twenty-four months, 40 calories. In computing the caloric requirements based on the weights on admission the same values were used.

The total number of cases tabulated was 125. Of these, 35 were cases of infantile atrophy, 72 cases of acute or chronic gastrointestinal disease, and 18 of miscellaneous diseases, including pneumonia, bronchitis, ulcerative stomatitis, typhoid fever, scurvy, syphilis, tubercular meningitis and pylorospasm. Two standards were used for comparison: First, the caloric requirements of each child calculated on the basis of his weight on admission; second, the caloric requirements for an infant of average size and of the same age.

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* This article will appear in full in Archives of Pediatrics.

The noteworthy features of the tabulated results were as follows: The percentage of deficiency in caloric requirements based on weight on admission was reasonably small, but the small gain—one-fifth of an ounce a day for all cases, two-fifths of an ounce for recoveries—suggested that it might have been possible to have exceeded the caloric minimum with benefit. The complicated atrophy cases showed about the same deficiency as the recoveries, but in the uncomplicated atrophies and in the miscellaneous groups, where no contraindication to full feeding existed, the diet exceeded the minimum requirement and the gain was proportionately large. In the gastrointestinal groups a similar difference was noted, but uncomplicated cases showed an actual deficiency instead of excess and received less food than careful attention to caloric requirements would have indicated. Certain well-known clinical facts had been corroborated, and, in the main, the truth of the danger to the infant's organism of underfeeding was clearly substantiated. The study offered a stimulus to greater care in the selection of dietaries since the percentage of the deficiency in some instances was startlingly large, and suggested the possibility that a more judicious substitution of food ingredients might have prevented some of the loss. The deficiency of caloric value of all the diets compared with the requirements of normal children of the same age formed an interesting comparison and must be judged with a view to the deficiency in weight on admission as compared with that of a normal child.

The value of a conclusion based on general averages could not always be applied to the individual case, and the danger of allowing theoretical considerations to outweigh clinical deductions must be emphasized. The estimation of the caloric value of diets must not be considered as a compulsory dietetic indication, and due regard must be had to the effect of diet on digestion. On the other hand, it was undoubtedly true that caloric deficiency or excess, if persisted in, was reasonably sure to be followed by nutritive or digestive disturbances. The results corroborated in general the impression that cases of acute gastrointestinal disturbance with fever, vomiting or diarrhea receive a diet more or less deficient in caloric value, and that gain in weight, on the average, went hand in hand with the administration of adequate nourishment.

DISCUSSION.

Dr. Charles Hunter Dunn, Boston, said he had always felt from his clinical observations the fallacy of the minimum caloric requirement. They had been tabulating the caloric value of the diet taken by about all the infants in their wards and the results differed from those of Dr. Gittings. He reported that the extremes in the numbers of calories required by different infants was not so great as to impair averages. Their experience was different in that the extremes were so great that no conclusions could be drawn or any system of averages that could be of value. The method of taking normal babies and average results was apt to be misleading and where there were wide extremes the average might be absolutely false for every individual baby. Some made no gain on the lower caloric values and gained when the calories were increased, and in some the minimum number of calories had to be doubled before the infant began to show a gain. The problem was complicated by individual differences in nutrition and digestive powers so that conclusions were of no value even as a guide in the average case.

Dr. Henry Dwight Chapin, New York, said he was glad Dr. Dunn had spoken as he had, for he, too, wished to protest. He believed that the value of the caloric method of feeding had been overestimated. It was the assimilation of nutrition and not the heat production that was of value. It should be remembered that the food elements must be in the proper proportions and that they were not interchangeable. In the feeding of infants one must provide for growth and it was not so much a problem of heat production as of whether the food was capable of causing growth.

Dr. B. S. Veeder said that Dr. Talbot's paper upset their ideas of physiology and of the relation of body surface to caloric requirements. He asked Dr. Talbot what method of computing body surface he had used. It seemed that, according to Dr. Talbot's idea, the caloric requirements would be according to the activity and that he was comparing babies doing different kinds of work.

Dr. Abraham Jacobi asked what would be the difference in the results between small babies that were underweight and those that were atrophic in consequence of having been sick.

Dr. Charles Gilmore Kerley, New York, said that, wishing to test the accuracy of the estimated caloric requirements of growing children, he had made observations and had found that some children required considerably more than the estimated standard. It also seemed to be true in older children that the number of calories required was dependent on activity.

Dr. J. C. Gittings, Philadelphia, said he did not draw any definite conclusions in his paper. He wished to see if there was a deficiency in the diets they were giving. Generalizations were dangerous and he had not attempted to make any. There were very few extreme in this series and he had presented it for discussion.

Dr. Fritz B. Talbot referred Dr. Veeder to Lissauer's original article, which he said would explain his criticism. To estimate the body surface, he started by taking shadow photographs and then calculating from the perimeter. In regard to Dr. Veeder's last point, these children were only observed when they were doing no work and the question of work did not come in unless one considered digestion itself and that added about 3 per cent. to the minimum heat production. In reply to Dr. Jacobi, Dr. Talbot said the charts showed babies of the same weight and length, but of different ages and all underweight. The eight and one-half months baby was naturally thinner than the one of four months of the same weight and the heat requirement was greater in the older children in all instances, though the body surfaces might be the same. As had been observed clinically, underweight babies were apt to be muscular because they cried a great deal, and being more muscular it was apparent that they required more heat to maintain the body heat.

THE FEEDING OF MALNOURISHED INFANTS WITH HIGH PROTEINS AND CARBOHYDRATES AND LOW FAT VALUES.

Dr. D. J. Milton Miller, Atlantic City, said that the method that he wished to present was the result of slow conviction and clinical experience and dealt with no theories of malnutrition. The most successful method of nourishing children of the class under discussion was by human breast milk, and too much time was wasted in seeking food substitutes before resorting to wet nursing. Buttermilk, eiweissmilch, Keller's malt food, etc., had all been tried and found applicable for a short time only. The low fat and high proteid or carbohydrate content were characteristic of this class of preparations. Many infants with an intolerance for cow's milk could be accustomed to it by feeding very minute quantities and very gradually increasing them at short intervals. No infant should be kept long on a fat-free diet. When the fat was reduced to minute proportions there should be a relative and often an absolute increase in the carbohydrates. Finkelstein's views were quite generally accepted that there was no danger from the proteins. In his series of cases the proteins were never excessive in quantity. He had never been impressed with the injurious effects of sugar, for should acidosis occur the results would not be serious and could easily be corrected. The series in which he had made his observations belonged to the extremely atrophic and marasmatic class. Skimmed milk formed the basis of the formulæ with 1 to 2¾ per cent. fat. Floured dextrin or dextri-maltose were added. The children were not kept long on a fat-free diet, though the percentage of fat might always be below that of the normal formula. Eleven children were fed on this principle and the results were very favorable.

GOOD RESULTS OF LOW FATS AND HIGH PROTEIDS IN CASES OF ARTIFICIAL FEEDING IN INFANTS.

Dr. Percival J. Eaton, Pittsburgh, said that at the 1912 meeting he had presented a short paper entitled "Problems of Infant Feeding Illustrated by Cases and Charts." They had continued the same general plan of feeding in all suitable cases and to-day presented another series of cases and charts from their hospital service, showing what could be done with infants whose heredity was not of the best and whose environment had been bad. These cases were uniformly in very poor condition and were typical of the feeding cases admitted to the Children's Hospital in Pittsburgh. Certified milk and gravity cream were alone used. No formulæ were pasteurized or sterilized. Dextri-maltose was used in each case and a proper quantity of citrate of soda, about one grain to each ounce of milk and cream in the mixture. The formulæ contained from 1.70 to 2.5 per cent. fat, except in certain instances in which it was entirely excluded for a short time. The essayist emphasized the following points: The most important was that the babies fed according to this general plan, even in hospital work, were less inclined to be ill and had a more stable life as well as a very consistent growth. The formulæ should be adapted in both quantity and quality as closely as possible to the individual infant; that was, the balance between the fat and proteid should be maintained for a given infant. These formulæ and all they used nowadays were practically home modified mixtures, which Bowditch and Bosworth had shown were more nearly correct than were laboratory mixtures, at least as a rule. Dr. Eaton called special attention to a printed form which was given each time a new formula was prescribed. It was so simple and complete that one seldom found a mother or nurse so stupid as to be unable to carry out the directions.

DISCUSSION.

DR. JOHN LOVETT MORSE, Boston, said that these two papers and all others speaking of a method of infant feeding, were a distinct step backward; they were past that period. One could bring a series of cases that got well on low fats and high proteids and carbohydrates or just as successful series could be produced on exactly the opposite, high fats and low proteids. The same could be said of sugar. By a study of the history, the symptoms, the stools, etc., the food must be planned to meet the needs of the individual baby.

DR. ABRAHAM JACOBI said that he disagreed with the last remarks. Rules were not made for the individual, but for the general population. There was an average health standard for the infant, for the child and for the adult. It was possible to be guided by the rule. Not every case needed to be fed from the individual standpoint from the beginning; the general rule might be applied at first and only when the individual did not develop properly under the rule might the physician show his shrewdness in meeting the special requirements of the individual. The remarks in the paper were correct and it was a question whether it would be necessary to repeat them if the papers that had been written were read, and then perhaps the new ones need not have been written. They should study their own literature and remember that short articles did as well and sometimes better than long ones.

Dr. Henry Dwight Chapin, New York, said that the pendulum had swung too far toward low fat formulæ in the feeding of babies. The children in institutions did not digest fats well, but one could get over this by not keeping the children in institutions. The remedy was fresh air. The children needed individual care and fresh air to assist in the oxidation of the fats. It was to be feared that the feeding of low fat percentages would result in a crop of rickets. The normal woman's milk was not low in fats and the proper proportion of food elements must not be interfered with. As long as they insisted on feeding large quantities of milk sugar they would see diarrhea and burning stools. There was plenty of milk sugar in all milk.

Dr. J. H. Mason Knox, Baltimore, said that he had very seldom seen an intoxication which could be attributed to sugar, nor was there very much starch intolerance and not much starch in the stools. The treatment of these children during the latter part of a gastrointestinal disturbance consisted in giving cereal and gradually increasing the quantity of scalded, diluted skimmed milk, and then gradually going on to whole milk.

Dr. Roger H. Dennett, New York, said that in these difficult feeding cases the individual variation was the main thing. After reviewing the various methods of feeding which had been employed from time to time Dr. Dennett said that every one of these ideas had observations to back them, and every one was true to certain series of cases. There were a number of babies that would tolerate a high percentage of fats, but would not tolerate a high percentage of proteids. In a case in which one could not decide from the history which element was at fault, one was apt to begin with a low fat formula as described in the two papers, until there was evidence that a change was needed, when one must select what seemed applicable. One might recognize every method as a measure to be used in certain cases and all methods as so many weapons, each applicable to certain individuals, while waiting for finer methods of diagnosis, so as to gain by an earlier selection of the most suitable diet for the individual.

Dr. Isaac A. Abt, Chicago, said he agreed that there was no method of infant feeding and that each infant must be considered by himself. The baby must be considered from the standpoint of tolerance for the food and the food from the standpoint of how much it could do in the upbuilding of the baby, and also how much injury it was capable of doing. All progress must be made in the direction of meeting the needs of the individual baby.

Dr. D. J. Milton Miller, Atlantic City, said that in regard to Dr. Talbot's question he did not know why boiling prevented the curds. He had never seen any but temporary injury from high percentages of sugar, and acid burning stools could be rectified by cutting down the sugar; they might occur with any of the sugars. In the paper the ideas expressed were not designated "a method." Dr. Miller said he did not believe in methods himself. He tried to adapt the food to the baby's peculiarities, and to do this he began with a definite percentage of fats and then increased it according to the indications. Children kept long without fats would develop rickets; the point was to increase the percentage of fats as rapidly as possible. Marasmic babies sometimes did well on fats from the very first.

Dr. Percival J. Eaton, Pittsburgh, said that the children in his series were the average kind met with in hospitals. They selected them because they were miserable. Dr. Morse's criticism was good. They used the general plan at first and in the paper he had made a plea for the recognition and study of the individual infant and the adaptation of the food to the infant. The children fed as outlined in the paper did well in not having bilious attacks or food poisoning. They all did better on a food containing comparatively high proteid and comparatively low fat content.

A PRELIMINARY REPORT ON THE CHEMICAL ANALYSIS OF INFANTS' STOOLS.

Dr. L. Emmett Holt stated that there were a number of interesting questions upon which a comparison of the chemical values in stools of different kinds would throw light. For purpose of comparison, stools had been classified into three varieties—formed stools, moderately loose stools, and very loose stools. The stools were not taken from cases of severe intoxication, but from the average difficult feeding cases of the better class of hospital cases. The number of stools in twenty-four hours were not considered, but only the entire twenty-four-hour specimens. In all analyses were made of 112 daily specimens. Charts showed the percentages of water, nitrogen and the various salts in each of the varieties of stools. The carbohydrates did not appear in the results of the analyses as such. This report was only preliminary and definite conclusions were not ready for publication, but it was believed that further work along these lines would throw light on some of the problems of infant feeding.

DISCUSSION.

DR. THOMAS S. SOUTHWORTH, New York, said that this was extremely interesting work that Dr. Holt had begun and he prophesied that if he persevered a great deal of good would come of this study of loose stools and formed stools. It might point the way to a method of bringing the condition of the intestinal digestion to where the intestinal contents would pass more slowly through the intestines. Just how this could be brought about he could not say, but so much depended on whether the intestinal contents were hurried along without an opportunity for absorption or whether the early digestion split the food into irritant substances which increased peristalsis and permitted their escape before proper absorption had taken place, that an investigation of this kind should prove most valuable. Dr. Southworth asked Dr. Holt whether he had met with the paradoxical condition that children who were constipated often lost weight, and whether he had any theory for this condition; one would expect a gain of weight under such conditions.

DR. FRITZ B. TALBOT, Boston, said that this work was very interesting. Dr. Holt had stated in closing that there was no way of telling about the carbohydrates as they appeared in other forms. He had estimated them in a very crude way by titrating the acidity of the stools. Assuming that the sugars were split up in disturbed digestion into a variety of acids, he had isolated three acids and titrated them. When the digestion of the carbohydrates got beyond a certain point there was a marked increase in the acidity occurring coincidentally with diarrheal stools.

DR. CHARLES GILMORE KERLEY, New York, said he would like to know, since the salts were a factor in the production of tetany, whether the production of a diarrhea would effect a relief of the tetany.

DR. L. EMMETT HOLT, New York, said that this paper was only a start, but that by further work along this line they might get information that would be valuable in infant feeding. He could not answer Dr. Southworth's question. Constipated stools were almost always alkalin and loose ones acid. In reference to tetany, he believed that it was true that if a diarrhea was produced the symptoms of tetany were relieved. He induced diarrhea and found that the children lost sodium and chlorin. Eliminating sodium and potassium relieved nervous irritability. When they produced diarrhea in tetany something was eliminated that resulted in benefit and the diminution in the electrical irritability was very great.

ONE HUNDRED AND FORTY-ONE CASES OF RECURRING VOMITING IN PRIVATE PRACTICE.

Dr. Charles Gilmore Kerley, New York. The diagnosis in these cases was based upon definite periodic attacks of vomiting. There were 70 boys and 71 girls. The average time the cases were followed was one hundred and four weeks. The family history showed that in one or both parents there was rheumatism in 40, sick headache and bilious attacks in 40. In the vast majority of the cases the children were the offspring of those who for two or more generations had not done manual labor. In 31 per cent. the appetite was good, 69 per cent. poor; in 59.5 per cent. there was constipation. In 83 the average hemoglobin was 63.5 per cent. and the red blood cells were 4,280,000. Sixty-nine had been difficult feeders on cow's milk and had been given the usual trial of foods. Recurrent colds had been present in 41 per cent. In 12 there was a definite history of eczema, 6 had a habit tic; in 14 there was a history of enuresis, and in 13 there had been rheumatism. The presence of acetone in the urine in the later attacks was noted with very few exceptions. The onset of the vomiting occurred during the first year in 37 cases, during the second year in 21, and during the third year in 21; in the remainder it ranged from the third to the ninth year. The duration of the interval between the attacks was very variable, as was also the severity of the attacks. Ninety per cent. of the series had temperature during the attacks. The temperature during the attacks varied from 102° to 105° F., 10 having had a temperature of 103°, 6 of 104° and 3 of 105° F. In 16 of the cases there was no apparent improvement; in some the treatment was carried indifferently, and in others no apparent impression was made on the disease. In the vast majority of the cases the recurrence could be controlled if continued family coöperation could be secured.

The dietetic management during the interval was the same in the main in all cases. If the case was a pronounced one, the patient was given a diet with few restrictions, except that cow's milk, butter and sugar were omitted. One egg was allowed every third day; saccharin was permitted as a sweetening agent. Three meals daily were allowed, but nothing between meals. Red meat was given scantily three times a week; poultry and fish were given at other times. In some cases skimmed milk was given, but not more than one pint daily. A grave error in the management of many children was the free use of cow's milk, butter and sugar. The period of lactation in the human was at most a year and then the child was ready for other food. The average child would be far better off if he did not receive more than one pint of milk daily after the fifteenth month. Sugar was not used except as a condiment until three hundred years ago. Unknown millions had lived without it.

The further treatment consisted in the internal use of salicylate of soda, bicarbonate of soda, independent or in combination, as advised by Rachford. In a pronounced case Dr. Kerley gave 5 grains of salicylate with 10 grains of bicarbonate of soda three times daily, at five-day intervals, or 20 to 30 grains of bicarbonate of soda daily for a month or two at first. This drug treatment was carried on for months or years, as the case might require. A very important factor was daily physical exercise, a warm bath, and a brisk rub at night. The use of physical therapeutics was important. The daily evacuation of the bowels was secured by suitable measures. During the acute attack a weak solution of bicarbonate of soda was best retained in a strength of 5 grains of bicarbonate of soda to 8 ounces of hot water. This was given freely. When the vomiting had occurred for twenty-four to thirty-six hours the patient was given colonic flushings with bicarbonate of soda, 2 drams to 8 ounces, at six or eight hour intervals. Nothing was gained by attempting forced feeding.

Judging from the results it would seem that Rachford, Howland and Edsall were correct in concluding that the chief error rested in this condition in the defective oxidation or in giving food substances of high carbon content in excess beyond the normal powers of oxidation. While not entirely convinced of Hare's theory in regard to the carbon intake and expenditure in its entirety, Dr. Kerley found it in peculiar harmony with the clinical facts under presentation, and while not forgetting that anaphylaxis and reflex neuroses from various abnormalities were still to be considered as operative causes in such affections as asthma, recurrent vomiting, migraine, etc., he emphasized the fact that eczema, spasmodic laryngitis, cyclic vomiting, and recurrent sibilant bronchitis and asthma, were all notoriously frequent in children of gouty, bilious or lithemic ancestors. All these conditions were met less frequently after the age of puberty, when the processes of combustion and tissue building were at their maximum. While two or more of these so-called pathological functions were not ordinarily observed simultaneously in the same child, not a few suffered from a number of these conditions in alternation; in other words, the processes seemed to be mutually compensatory. In every instance the diet was a most pronounced factor influencing the susceptibility of the patient.

DISCUSSION.

Dr. Irving M. Snow, Buffalo, said his ideas were at variance with those of Dr. Kerley. In the case of a child that had been nursed and began to vomit at the age of two years, attacks of recurrent vomiting began and steadily grew worse, until, at the age of six years, it was thought the child would die. She had gastric hemorrhages and 60 to 70 per cent. acidity. During her last attack it was thought that she would die and that she was suffering from duodenal ulcer with delayed motility. She was given cream, butter and bacon for the purpose of reducing the hyperacidity and also strong alkalies. This was a case of recurrent hyperchlorhydria and the child made a complete recovery. The gastric fluid was examined and undoubtedly the child was benefited by fats.

Dr. Charles Hunter Dunn, Boston, said that in a similar series of cases which he had seen in private practice and in association with Dr. Rotch, he had been interested in acid intoxication. It seemed to him that there were two classes of cases —one seemed to be true cases of acid intoxication; the other class were cases of recurrent vomiting in which large doses of bicarbonate did not seem to be of the slightest benefit. He had now given up the use of bicarbonate of soda in these cases because of 2 cases of fatal hemorrhage, which had made a great impression on him. In these cases rectal feeding was important. He used to give bicarbonate of soda by the rectum, but did not risk it now. The presence of acetone was a symptom only.

Dr. Alfred Friedlander, Cincinnati, said that Martin Fischer and others who used the alkalin treatment in severe cases were now using a solution of dextrose (20 grams) and sodium chlorid (14 grams) to the liter by rectum. The results thus far were surprisingly good; the profound exhaustion had not appeared and the patients had rallied more promptly. It had been used for too short a time to make definite statements, but this treatment ought to go on record because of the excellent results claimed for it.

Dr. Isaac A. Abt, Chicago, said that the diet during the interval had no effect on the recurrence of the attack. These attacks occurred about so often, no matter what food was taken. A nervous attack or a mild infection might bring on an attack. In the treatment of these cases 8 per cent. glucose in normal saline solution by rectum had been recommended. Dr. Abt said that he gave bicarbonate and ice-cold chloroform water, frequently repeated.

Dr. J. P. Crozer Griffith, Philadelphia, said that curiously enough he had come to the conclusion years ago that there were cases of recurrent vomiting that could be benefited by bicarbonate and others that were not helped by it at all. Even between the attacks the bicarbonate had no effect. Recurrence did not necessarily mean recurring at specific times. In his experience patients had been benefited by an alteration of the diet, while others again were not helped at all by such a change. He had found nothing as good as a hypodermic of morphin; it might be said that it stopped elimination, but it was also true that it sometimes saved life. There were cases of recurrent vomiting that looked like intestinal obstruction.

Dr. Henry Heiman, New York, said that cyclic vomiting was known by many titles and clinically might be mild, moderate or severe. It was a metabolic disturbance of fats as well as of proteids producing acetone bodies. The acidosis was not fatal, but he had seen a case of eclampsia with a temperature of 108°F. and no treatment could have saved the child. The moderate cases responded to bicarbonate in peppermint, which acted as a mild local analgesic. One might also use bicarbonate in small amounts by rectum, by hyperdermoclysis, or by intravenous injection. Intermittent treatment acted as a prophylactic.

Dr. John Ruhräh, Baltimore, said it seemed to him that they were confusing several different conditions, certain cases of crude anaphylaxis, acid intoxication from errors of diet, and other conditions, as definite food poisoning. The proper management of the diet between attacks certainly did good. If the condition was due to excess of fats, proteids, or carbohydrates, it certainly did some good to remove the offending substance. There were attacks due to reflex nervous conditions which recurred, but it was difficult to say what was the basis of these.

Dr. Henry L. K. Shaw, Albany, N. Y., said he wished to emphasize the sudden fatality of some of these cases which gave a favorable prognosis. A case had come under his care similar to the one referred to by Dr. Kerley He had seen the child on the second day and had given a favorable prognosis. On the third day there was evident acetonuria and he had stopped the bicarbonate. The child died suddenly a few hours later.

Dr. J. H. Mason Knox, Baltimore, called attention to the fact that in certain cases in older children in which there was hyperacidity, atropin pushed to its physiological limits, in connection with other means, would be found effective.

Dr. William P. Northrup, New York, said that Dr. Kerley had referred to a discouraging case that had responded to massage under a tactful and efficient nurse. In the same way he had cases which were led on to complete recovery by massage after other measures had failed.

Dr. Charles Gilmore Kerley, New York, said that he realized that there might be starvation of carbohydrates and sugars, but an excess of sugar was just as bad in its results as too little. He had found physical therapeutics a most valuable adjunct in the treatment of recalcitrant cases. These cases were not due to anaphylaxis, but rather answered the description of acidosis as accepted at the present time. He did not know why the diet in the interval should not be of benefit; the great difficulty was to have it properly carried out.

WEIGHTS AND MEASUREMENTS IN INFANTS AND CHILDREN.

Dr. Rowland G. Freeman, New York, said that while he believed that weight charts were a positive disadvantage when given to the family, there could be no doubt but that a physician in feeding a baby should have certain standards in mind. They knew in a general way that the mortality of well-cared-for children was very slight, but there were no definite data for the comparison of these children with others less carefully reared. There had been collected a considerable number of weights and measurements of school children in the United States, but the only data of children in private practice were those of W. Camerer (*Jahrb. für Kinderhk.*, 1901, Vol. LIII., p. 381). He had therefore made an average weight chart of 278 cases in private practice, as well as charts showing their measurements, and in order to get definite data for comparison he had taken the weights and measurements of 1,000 children in the Roman Catholic Orphan Asylum of New York City. There were about 500 boys and 500 girls. These institutions were situated very favorably, overlooking the Hudson River, and the children were living under very good conditions. The first chart showed the weight of 120 well-cared-for children compared with the weights of institutional children. It was noticed that there was considerable difference after the first month. The general average weights taken from Dr. Holt's book also fell well below the well-cared-for children. The difference between breast-fed and artificially-fed children was also shown and was favorable to the breast-fed children during the first nine months. The well-cared-for children were almost all artificially fed after the first month, and it was shown that the "American method" of feeding compared favorably with those methods advocated in Germany. The behavior of these children after the first year was shown by a third and four chart. It was noticeable that while from the second to the fourth year the Orphan Asylum children averaged nearly as much as his series, the groups were small and the institution children were much older. It was an evidence of the excellent care given these children that they averaged a quarter to a half pound heavier than the 69,000 school children. Both of these groups, from six years on, were well below the well-cared-for children. The last chart represented the measurements in length of the 278 well-cared-for children as compared with the 1,000 Orphan Asylum children, and the 98,000 school children showed that the Orphan Asylum children again averaged somewhat taller than the school children, but were well below the well-cared-for children. These observations showed a surprising advantage of the well-cared-for child over the others at all ages, and at the twelfth year the well-cared-for child surpassed the average by 40 pounds in weight and six inches in height.

DISCUSSION.

DR. THOMAS S. SOUTHWORTH, New York, said that if one assumed that the average weight of an infant at the age of one year was 21 pounds, it was because some weighed considerably more and others considerably less than this standard. This difference in extremes was due to environment, feeding, accidents of ill health, etc., that had happened during the first year. It was most important to differentiate between breast-fed infants and those artificially fed at certain periods of the first year. The normal breast-fed infant grew more rapidly at first, but slowed down later, while in the bottle-fed infant the reverse was true; it gained more rapidly during the latter part of the year. The breast-fed baby showed a tendency to relax his gain at three or four months when the maternal milk supply became relatively insufficient. At this time attention should be directed to increasing the milk supply if the child was to be kept up to the maximum gain. During the last six months there was a relative insufficiency of breast milk which must be supplemented; it was therefore most important that every child should be carefully supervised during the first year of life, as it was thereby possible to keep the child gaining rapidly, and in this way one could add to the food when there was a tendency to fall below the proper weight. Avoidance of infectious colds during the first year was most important, as they might cause a delicate child to stand still in weight.

DR. GODFREY R. PISEK, New York, said that the lack of accurate figures for weight and height in children between the ages of two and five years was to be deplored. He had looked forward to the time when this Society would adopt resolutions requesting each member to contribute a series of measurements of children in his private practice. There should be such a collective investigation by the Society.

DR. HENRY L. K. SHAW, Albany, said that he agreed with what Dr. Pisek had said. In New York State every physician who examined a school child under the new law had a blank to fill out showing the weights and measurements that he had taken. There were more than 98,000 from which to draw an average. There were at present fifty or sixty score-cards in existence. The standard score-card devised by the Women's Public Health Committee of the American Medical Association might be adopted if the form promulgated by the Smithsonian Institute was not used.

Dr. Godfrey R. Pisek, New York, said they could not accept the statistics of New York City, as the measures had been indiscriminately made. The figures that they would want must be based on an absolute standard like that of the Smithsonian Institute.

Dr. Rowland G. Freeman said that he would like to point out one fact in regard to the normal weights during the first year. The average gain during the first three months was 5 pounds; during the second three months 3½ pounds; during the third three months 3 pounds, and during the fourth three months 2 pounds.

DISEASES CONNECTED WITH MECKEL'S DIVERTICULUM, WITH SPECIAL REFERENCE TO DIVERTICULITIS.

Dr. J. P. Crozer Griffith, Philadelphia, stated that this case which he reported occurred in a child nineteen months old, who after a slight indigestion, began to suffer from an increasing anemia, and on one occasion from suppression of urine. There was a history of reddish-colored stools. The condition of the stools continued with increasing anemia and abdominal pain, gradually becoming very severe, with tympanites. A rectal examination revealed nothing abnormal. Finally a clinical diagnosis of secondary hemorrhage depending on hemorrhage somewhere in the intestinal tract was made. There had been a moderately irregular febrile reaction. At autopsy they found probably a primary ulcerative inflammation of Meckel's diverticulum, which was the cause of the persistent leaking of blood from the bowel, and of the severe anemia. This inflammation extended to the serous layer of the diverticulum, producing a secondary purulent peritonitis, localized by the matting of the coils of the ileum around the seat of suppuration. The severe abdominal pain was due to this peritonitis, and, in part, perhaps, to the kinking of the intestine, making evacuations of the bowel difficult and accounting for the constipation. The origin and bearing of the nephritis was uncertain, but it appeared to have little part in the complex of symptoms and the fatal termination.

None of the affections of Meckel's diverticulum appeared to be of common occurrence, although a persistence of the organ in some form was found in 2 per cent. of all persons. Lesions of Meckel's diverticulum seemed oftenest to produce symptoms in adult life. Among the lesions of Meckel's diverticulum were strangulation of the intestine by the diverticulum or its remains, the persistence of Meckel's diverticulum with an opening at the umbilicus, the formation of cystic tumor concretions, a superinvolution of the diverticulum, volvulus of the diverticulum, hernia of the diverticulum, and inflammation of Meckel's diverticulum, of which the case reported was illustrative. After discussing each of these lesions, Dr. Griffith considered the causes of diverticulitis, which he stated were very obscure; the pathology, however, was similar to that of appendicitis. The diagnostic features might be summarized as follows: (1) Localization of pain and tenderness, not so often at McBurney's point as somewhere higher and to the right of the umbilicus, or even about it in some different region. (2) An area of puffiness or firm resistance in this region. (3) Absence or slight degree of meteorism, at least early in the attack. (4) The presence of blood in the stools and in the vomited matter. (5) The earlier existence of an umbilical hernia, or of some malformation somewhere else in the body. Thus far Dr. Griffith had not been able to find that the lesion had ever been correctly diagnosed during life.

THE NEW SARAH MORRIS CHILDREN'S HOSPITAL OF CHICAGO.

Dr. Isaac A. Abt, Chicago, gave a lantern slide exhibition, showing the interesting features of this modern children's hospital. The plans of the different floors were shown and the features of special interest. Among these were the room for bathing the infants, where an automatic recorder registered graphically the exact temperature of every bath given, so that these records were available for the head nurse and the physician; and an arrangement by which an entire wing of the building could be completely shut off from the remainder of the building in the event of an epidemic. The institution accommodated 125 patients and had cost $250,000. All ward closets were built into the walls.

ANTHROPOMETRIC METHODS, WITH SUGGESTIONS FOR IMPROVEMENTS, BASED ON THE MEASUREMENTS OF 540 INFANTS.

Dr. Henry L. Coit, Newark, said he had been led to make this investigation by the fact that the score-cards used for the better baby contests showed certain defects. He had weighed these 540 babies and taken measurements of height, length of limb, length of trunk, circumference of head, etc. There was such a variation of the measurements that it seemed advisable to make three standards—a general standard, an average for males, and an average for females. Averages were desirable which should take into consideration the racial and other factors which were shown to have an effect on large classes of infants.

THE ARTIFICIAL COOLING OF SICK ROOMS IN SUMMER: A PRELIMINARY REPORT.

Dr. Henry Heiman, New York, said that his paper was based on an experiment in the artificial cooling of the children's ward for enteritis in Dr. Koplik's service at Mount Sinai Hospital, New York City. They were of the opinion that gastroenteritis was a nutritional disturbance, having a secondary bacillary basis which accounted for its marked prevalence during extreme heat. The temperature of the room ranged from 63° to 74° F., with the exception of one day. It remained at 69° for forty-two days and was at all times 5° to 11° cooler than the outside air. The relative humidity was very much the same as the outside air, but the absolute humidity was diminished by the cooling. Thirteen selected patients were placed in this room and were given treatment in other respects no different from that of any ordinary case of enteritis. As gastroenteritis was not very prevalent during the past summer they had few cases and there were none in the general wards with which to compare those in this series. While it was too soon to draw conclusions, they had gained the impression that in this ward the children were more comfortable, cried less, and looked less sick and parched. They did not wish to belittle the other methods of treatment, but they wished to introduce this one as a help. This method was not applicable to moribund or premature infants, but was suitable for all others.

Dr. Heiman gave a lantern slide exhibition illustrating the apparatus used to effect the cooling.

DISCUSSION.

Dr. Henry I. Bowditch, Boston, said he would like to point out one pitfall in connection with an apparatus of this kind. One of the best features about the apparatus presented were the short ducts which prevented the collection of dust. In Boston they had had a similar plant, installed at great expense, but the fan was a long way from the coil room, and as a consequence the ducts all became clogged with dust. A series of apparatus placed near the ward would be better than a central plant a long way from the ward.

Dr. Fritz B. Talbot, Boston, said that Dr. Bowditch had failed to say that they tried one day to start the apparatus and the dust was so great that 75 per cent. of the children and all the nurses in the wards contracted infectious colds.

Dr. B. S. Veeder, St. Louis, said they had one room in the Children's Hospital at St. Louis which was cooled by refrigerating pipes all along one side of the room; it was thus cooled without any cool air being forced into the room.

Dr. Samuel S. Adams, Washington, related his experience with a boy, three years of age, in a private house. The temperature outside was 90°F., and by means of an electric fan, which drove a current of air over a large piece of ice, the temperature of the room was kept down to 75° or 80° F. Care was taken that the current of air did not strike the patient. The mother feared that this was not good for the child, so the temperature was permitted to rise, and as soon as this occurred the child went into coma. It was finally decided to take the patient to a cooler place and he was taken to an elevation in New York State. When he reached this place the immediate effect of the cooler temperature was strikingly beneficial.

Dr. Henry L. K. Shaw, Albany, described their cooling plant at St. Margaret's Hospital in Albany, which consisted of a pipe rigged up so as to drip on a sheet. It had cost about five dollars and had considerable effect on the atmosphere of the room.

PRIMARY SPLENOMEGALY IN AN INFANT.

Dr. J. H. Mason Knox, Jr., and Dr. R. H. Wahl, Baltimore, reported this case, which occurred in an infant eleven months old. The child had never thrived and weighed 11 pounds. There was general malnutrition associated with idiopathic enlargement of the spleen, liver and lymph glands, and a peculiar yellowish pigmentation of the skin of the exposed parts. The blood picture was normal until a few days before death, when it assumed the appearance characteristic of lymphatic leukemia. At autopsy the liver, spleen and the lymphoid tissues were very much enlarged and firm. Histologically, there was more or less complete disappearance of the lymphoid elements which were largely replaced by large, swollen, rounded, or polygonal cells with small nuclei and abundant foamy appearing cytoplasm. The affected organs showed a variable amount of iron containing pigment. In this case the large cells apparently arose from both the endothelium and from the recticulum. The picture in the spleen resembled that first described by Gaucher in 1882. The condition suggested a system disease of the lymphaticohemapoetic tissues, but apparently any reticulated tissue might be involved. The condition was probably very closely related to other blood diseases.

A CASE OF GAUCHER'S DISEASE: SPLENECTOMY AND RECOVERY.

DR. CHARLES HERRMAN, New York. (See p. 340, ARCHIVES, May, 1914.)

DISCUSSION.

DR. THOMAS SOUTHWORTH asked Dr. Herrman if he had advised operation in the sister as a measure that might be employed to limit the progress of the disease.

DR. L. EMMETT HOLT, New York, asked what the result was in the other cases operated on.

DR. J. H. MASON KNOX, JR., Baltimore, said he wished to emphasize what Dr. Herrman had said in regard to the difficulty of making a diagnosis without a pathological examination unless there was another member of the same family affected with the disease. The advisability of doing a splenectomy early was a difficult problem, as one did not know when the disease extended to other organs. It might be possible by means of a trochar to get a specimen of spleen pulp for a pathological examination from which one could make a diagnosis; this would not be a dangerous procedure.

DR. CHARLES HERRMAN, New York, in reply to the question as to whether he had advised operation on the sister, said that it would be difficult to get the consent of the parents when the child was not in great and immediate danger. As to the suggestion of obtaining a specimen of the spleen pulp, there was no doubt but that some day this would be done. As to the cases operated on, there had been 9 reported. The first was Dr. Bovaird's and was operated on by Dr. McCosh. At the time it did not attract much attention. Of the 9 cases reported, 3 had died and 6 had recovered. The eldest was thirty-seven years of age and the youngest three years. In the future more cases would be operated upon, and the operation would be done earlier. There was no greater danger from this operation than from similar ones done for other conditions. The drug treatment had been of no effect. The cases operated upon had been followed only a few years and it is too soon to judge of ultimate results.

SHALL A DEPARTMENT OF PEDIATRICS INCLUDE IN ITS CURRICULUM THE THEORETICAL AND PRACTICAL TRAINING OF MEDICAL STUDENTS IN SOCIAL MEDICAL WORK AMONGST INFANTS AND CHILDREN?

Dr. Henry J. Gerstenberger, Cleveland, recalled that in a paper on a similar subject last year, Dr. Gittings had said: "Between the prevention of disease and the preservation of health there is no essential difference, and surely the physician and not the sociologist should be the logical arbiter of all problems relating to health." If they were willing to take the first step they should be ready to take the second and to see that the "logical arbiter" was properly trained and prepared for his work. They were aware that the future welfare and development of the medical profession and its importance in the eyes of the public at large depended more upon the manner and thoroughness in which medical men were trained in this work than upon any other one factor. There was no field of medicine today which gave greater opportunities for the successful application of preventive medicine than that which dealt with infancy and childhood. The widest application of preventive medicine would sooner or later be accomplished through the State, especially through municipal boards of health. The ideal scheme for the application of preventive medicine in public health work would be one dispensary in a small district with a well-trained, full-time medical director in charge, aided by an adequate nursing staff and social worker, together with such medical assistants as might be necessary to care for all the medical and social ills of the people in his district, except obstetrical and postpartum cases. This physician should have as his administrative head the commissioner of health and as his vigilant advisers and counsellors for the different parts of his work men at home in their special fields of medicine. These same men should be the heads of their respective departments or sub-departments of the university medical school or some one of the university staff appointed by such head, for the simple reason that after all was said and done our greatest hope for completeness of knowledge, for ideals, and for stable policies in medical education in America are the universities. This would give the student the opportunity to get in touch with practical work. Those in charge of the pediatric department had a great duty to perform in opening the eyes of the future medical men to the vast field that lies in this direction. They could thus teach the importance of pediatrics as the broadest type of internal medicine applied to the most sensitive and the most easily influenced group of human beings, the infant and the child, and it is therefore second to no department in its opportunity for valuable work.

This plan was being followed in Cleveland. During the senior year the class was divided into four sections and each section spent one and one-half to two hours for eight consecutive weeks in the wards. The student got an experience in the contagious wards, in the practical work of the milk laboratory and in the homes of the poor, and became acquainted with the ideals and methods of charitable, philanthropic and religious and municipal agencies that might be used in improving the conditions of infants. This work was appreciated by the men and they were convinced that the seed had been sown and that it was recognized that all public health work and social medical work must be based on scientific medicine. The ideal plan embodied first the solid foundation of scientific facts; second, the practical training that permitted the individual best to apply these facts, especially in the prevention of sickness and death; third, the coöperation that brings harmony into the work and prevents wasteful reduplication.

DISCUSSION.

Dr. Henry Dwight Chapin, New York, said that hospital and institutional work was of little value unless it took into consideration the ultimate condition of the child, and then it became highly useful and valuable. Institutional work was very different from home work and frequently the interne with a good record failed to adjust himself to conditions in the homes of the poor. If the universities could give the time to instruct the men in this work, it would be of great value, but at present the universities did not have the time. The most crying evil of the day was that men were turned out with insufficient training. With reference to the social service work, the first step in this direction was taken by the Children's Hospital in 1900. Every home was now visited and the physician knew the exact conditions surrounding the child in the home. In the future this work would loom up greater and greater. In order to avoid the danger attendant on the misdirected efforts of emotional and untrained workers this work should be in the hands of the physician, who should not only oversee it, but should carry it out. They had begun with women physicians, but found that nurses seemed to be better fitted for the work, which seemed to require a peculiar personality. They must have tenderness and must be something more than trained technicians.

Dr. A. D. Blackader, Montreal, thought it was a question whether this ideal in teaching could be reached because of lack of time. He said they now had a five-years course at McGill University and the fifth year was entirely given to clinical work. It was their endeavor to turn out men well equipped for general work. It might be possible to make such training in social pediatrics a post-graduate course. He was glad that Dr. Gerstenberger had spoken of the useless overfeeding of tuberculosis patients and of the needless giving of certified milk.

Dr. L. Emmett Holt, New York, said that he did not think the outlook was as bad as had been pictured. The subject of pediatrics was getting much more time than it used to get. It was getting as much time as obstetrics and, generally speaking, was being recognized more and more all over the country. We have just heard that Cleveland, St. Louis, Harvard and Columbia do not neglect this branch of medicine. The men at Columbia get a pretty thorough knowledge of what pediatrics means and the work is not optional; the men must take it to get a degree. The physician and the pediatrist have held aloof from social work, but it is impossible in many instances for them to take an active part. Still they should find time to give the work their influence and support. The Association for the Study and Prevention of Infant Mortality invites medical men to take part in its work and blames them for not taking a more active part in the work. The student should have an introduction to this work before he is out and his time is taken up with other things.

Dr. Fritz B. Talbot, Boston, said that in the Massachusetts General Hospital they had a well-equipped social service department and felt that they could not get along without it. The criticism was frequently made that medical men would not take the responsibility that social work would impose.

Dr. J. H. Mason Knox, Baltimore, said he wished to endorse what Dr. Gerstenberger had said. If people had waited for this Society to become active many babies would have lost their lives. While the people are interested in this work they look to the members of this Society to take part. The work cannot all be done by pediatrists, but they should interest everyone in the work who loves the baby. The pediatrist can direct, even if he cannot do the work himself. Infant consultations would furnish another opportunity for the student. Here he would see the babies that come week after week for advise as to how to keep well. In this way the student will become interested in the work of prevention and will go out with a knowledge of how to keep babies well in addition to knowing how to cure them when they are sick.

Dr. John Lovett Morse, Boston, said that Dr. Rotch had introduced a course into Harvard on preventive medicine in the fourth year which was elective. They had found that this method was not very satisfactory and they were now planning to put the fourth year men into the hygiene stations. In the new hygiene department they gave a course of lectures and the students were taken to the hygiene stations two or three afternoons. There was not sufficient correlation between the different agencies engaged in the work of looking after children and in the prevention of infant mortality.

Dr. J. C. Gittings, Philadelphia, said that from present indications we would soon be on the Chinese basis. He wished to emphasize how strongly he felt on this subject. The physician with a well-established practice could not do much more than extend his sympathies. It was necessary to have trained directors for this social work and he believed that the men would now qualify.

THE PATHOLOGY AND PROPHYLAXIS OF RICKETS.

DR. JOSEPH E. WINTERS presented this communication, in which he described the abnormalities in ossification which showed conclusively to him that whatever inhibited assimilation of salts in food caused rickets, and that which insured assimilation of salts in food prevented rickets. Salts to be assimilated must be in organic synthesis with protein. In every food produced in the laboratory of nature, salts were in organic synthesis with protein. Disintegrate this synthesis and every food was a rachitic food. Condensed, evaporated, dessicated milk, whey powder and every dry preparation of milk was a rachitic food. The synthesis of salts with protein in milk was light, hence easily disintegrated. The child fed on cereal might be extremely emaciated and markedly rachitic. Cereal dextrose, glucose, maltose and malt soup inhibited the assimilation of salts in young infants and endangered rickets. Hit or miss modifications of skimmed milk were also productive of rickets. Digestion of protein was by gradual erosion, therefore the young infant could not digest protein unless in finely divided flocks. There might be innumerable points of catalytic action of enzymes. The neglect of the physical behavior of protein superinduced rickets in that it precluded salt assimilation. Ample fat was requisite for salt assimilation. In order to make easy the digestion of protein, he used the top one-half ounce from a quart bottle of milk sixteen hours after milking, diluted with water and lime water, and acidulated at feeding temperature; this yielded an immense number of finely divided, light, feathery flocks, easily reduced to a semi-emulsified condition by stirring. The prophylaxis of rickets must be sought in the physical behavior of protein. The proportion of salts in mother's milk was diminished with the increasing age of the mother, in the later months of lactation, during pregnancy in lactation, and from frequent pregnancies, and might be the cause of rickets. Syphilis, tuberculosis or mal-hygiene predisposed to, but did not cause, rickets.

DR. ROWLAND G. FREEMAN, New York, said that it seemed to him that it was time they stopped considering rickets as a disease due to food at all. Food never caused this disease, though it might modify its course. Some of the worst cases of rickets that he had seen had been in babies on good breast milk. Rickets usually occurred in people from the tropics and developed only during the winter, when the children were shut up. It seemed to him that rickets was a disease due to bad air.

Dr. L. Emmett Holt, New York, said that he had been interested in a comparison of breast milks in reference to the salt content. It took a large amount of breast milk to make the examination for salt, so they had collected it by taking a large number of samples and putting them together, and by taking the milk from one mother for a longer period of time. One quart was necessary for the experiment. Everything went to show that the salts were not deficient during the latter months of lactation. The salt content of the latter months did not differ from that of the second, third, or fourth month.

Dr. Isaac A. Abt, Chicago, asked how the essayist reconciled what he had said with their previous views in regard to phosphorus and magnesium metabolism; what was the rôle of the internal secretions on the production of rickets, and how he explained rickets in breast-fed infants.

Dr. L. E. La Fétra, New York, said that there was a class of young and feeble, and especially of premature, babies that in spite of the best hygiene and feeding still developed rickets. Something seemed to have influenced these children before birth that produced a tendency to rickets. It was a question whether the food factor or even fresh air entered into the problem. There might be something in the internal secretions that was responsible.

Dr. J. P. Crozer Griffith, Philadelphia, stated that he had seen rickets in a still-born infant and that there seemed to be a hereditary factor. This had been studied by an Italian physician in reference to the past histories of families. He found that even with the best feeding and care children with this inherited tendency would get rickets. While he felt sure that there was something inherited he could not say what it was.

Dr. Fritz B. Talbot, Boston, said that he had, with the help of a social worker, studied 100 cases of rickets from every point of view and after he was through he could find no definite cause for the disease.

Dr. Joseph E. Winters said there might be an inherited factor in rickets and there was no reason why there could not be congenital rickets, but here the underlying causes were those he has spoken of, the diminution of proteids and salts. As to the cases of rickets in colored and Italian children, one could not be at all sure that they were not due to bad feeding, as without the help of a social worker it was impossible to get at the truth regarding the feeding. If rickets were wholly a result of atmospheric conditions, one would not hear of such cases as Dr. Gittings had reported. Hygiene might be a predisposing factor, but it did not play an important rôle. The fact that children developed rickets on the foods that he had indicated and got over them when put on the breast was evidence that other factors were subordinate to those involved in the feeding.

SOME RESULTS OF THYMUS EXTIRPATION.

Dr. John Howland, Dr. E. A. Park and Dr. R. D. McClure, Baltimore, presented this communication, which was read by Dr. Park. They reviewed the recent work of Matti, Klose and Vogt in which they have shown that the extirpation of the thymus gland in young dogs gave rise to emaciation and death several months afterwards. Their work showed further that most pronounced changes in the skeleton took place, changes identical with those of rickets in human beings. Von Basch and others had found as a result of thymectomy in dogs transitory changes in the skeleton resembling human rickets, but had failed to find that the thymus gland was essential to life. Dr. Park stated that their experiments also had failed to show that the thymus gland was essential to life. Some of their thymectomized animals had shown retardation in development of such extent that at the end of six months they were not much more than one-half the size of the controls, but were nevertheless active, healthy-looking, normally-formed animals. They had found no changes of a rachitic nature and, therefore, felt certain in the belief that the thymus gland in dogs was not essential to life and that the changes which resulted from its removal were not of so gross a nature as had been reported in recent work, which had come particularly from Germany.

DISCUSSION.

Dr. Alfred Friedlander, Cincinnati, said that it was difficult to extirpate the thymus completely; in certain instances there were accessory thymi and these easily regenerated and took the place of the original thymus and affected the results of experiments. Thymectomy in the human being was an exceedingly dangerous procedure and there was no absolute indication for doing it. By the operative method, the mortality had been shown to be 33 per cent., while the method of shrinking the thymus with the X-ray had proved simple and safe, there having been but one death in 27 cases. They were justified in claiming that in the X-ray they had a means of treating enlarged thymi that was just as effective and much safer than thymectomy.

Dr. Isaac A. Abt, Chicago, asked what a large thymus was, whether it was one that appeared large by examination with the X-ray, or one that produced symptoms. He felt that diagnosis by means of the X-ray alone was not sure. If one outlined the thymus by percussion and there were associated symptoms which were confirmed by the X-ray, one might be justified in making a diagnosis of enlarged thymus. The only place where the X-ray could be absolutely relied upon was in the cap thymus; in other forms of enlargement the clinical evidences were more sure and the X-ray only confirmatory.

Dr. E. A. Park, Baltimore, in closing the discussion, stated that in regard to the difficulty of completely extirpating the thymus, they had looked for these rests and believed their presence had been greatly exaggerated as they had been unable to find them. The operative removal of the thymus ought not to be particularly difficult. As performed by Halstead, the operation was simple and ought not to be attended with great danger.

THE DIAGNOSIS AND TREATMENT OF THE LATE TYPE OF HEREDITARY SYPHILIS.

Dr. Borden S. Veeder and Dr. R. C. Jeans, St. Louis:—During the past two years we have seen 122 cases of hereditary lues at the St. Louis Children's Hospital. Of these 74, or 60 per cent., belonged to the group usually described as late syphilis, while only 48, or 40 per cent., were infants under one year of age with the classical symptoms of rash, coryza, enlarged spleen, etc., which belong to the early stage of hereditary syphilis. This ratio was the reverse of the figures usually given of early and late hereditary syphilis and was due to the inclusion of cases which were not looked upon as luetic before the frequent use of the Wassermann reaction. In only 12 of the cases were we able to obtain a positive history of early lesions in infancy, while in 25 cases the history was definitely negative regarding this point. In the remaining 27 the history was uncertain and indefinite. Blackfan and Nicholson, who tested the blood of 101 infants in St. Louis, 33 of whom were from our clinic and who showed no physical signs of lues, obtained a negative reaction in 98 cases, a doubtful one once and a positive one once. There was a wide variety of lesion encountered, and in many cases the lesions were multiple. In every case in which these lesions occurred, the Wassermann was positive. The large number of our cases with lesions of the central nervous system, 43 per cent., was one of the most interesting things in connection with this series from the standpoint of diagnosis. Among the unusual lesions were an aortitis and a torticollis. Three cases were tested for indefinite pain of obscure origin which had persisted irregularly for some time and all gave positive reactions and the pain disappeared under specific treatment. The absence of Hutchinson's teeth in our series was very noticeable. In 48 cases, old enough to have permanent incisors, the teeth were notched in but three instances. So many cases have given positive Wassermann reactions that we now make it a routine practice to examine all cases with chronic lesions of the central nervous system and many acute cases. Likewise in cases with acute joint lesions and those frequently looked upon as rheumatic the Wassermann test was made. We believe that the routine Wassermann reaction will explain the basis of many clinical conditions of obscure etiology met with in children. The treatment we have evolved consists of a combination of neosalvarsan and mercury. We prefer the neosalvarsan because of the simplicity of the technique. The neosalvarsan was dissolved in 1 c.c. of freshly distilled water for each decigram and injected intravenously into any available vein with a Record syringe. We have given up the muscular injections because of the pain and discomfort and the objections of the parents. The dose varied according to the age and the clinical condition of the patient. We have found neosalvarsan fulfils the requirements in children and is effective. For the treatment of acute lesions, the neosalvarsan is far more effective than inunctions of mercury. The gray powder can be given over long periods of time with less disturbance than mercury in any other form. We have had no experience with mercurial injections.

The course of the treatment in acute lesions varies but is generally as follows: Three or four intravenous injections of neosalvarsan are given with a gradually increasing dosage. Then the mercury is started in small doses which are regularly increased until the patient is taking fairly large doses In a few weeks this is interrupted for a short time and then started again. In a number of cases, a second series of inunctions was given. As the cases differed so much, a number were reviewed in illustration of the method. We have given some 200 intravenous injections of neosalvarsan and have never noticed any bad or unpleasant effects except nausea and vomiting in a few instances. There could be no question as to the value of neosalvarsan in acute lesions with the exception of interstitial keratitis. In the acute joint lesions, ulcerations, general convulsions, torticollis, etc., the effect seemed to immediately follow the first intravenous injection. They had been able to secure but little permanent effect from neosalvarsan, nor had they observed any advantage from its use in chronic cases of the late type, that was where there were such lesions as cerebrospinal syphilis, or interstitial keratitis which has been present for some time. The most intensive treatment with combined neosalvarsan and mercury had been of little avail in these cases. The Wassermann reaction was stronger in hereditary lues than in any other form of syphilis and hence was correspondingly more difficult to make negative. It was apt to become positive if treatment was stopped when it had been negative as the result of treatment. No case could be looked upon as cured until a negative Wassermann had been obtained and remained negative without treatment for some time.

DR. CHARLES GILMORE KERLEY, New York, said that it was very comforting to hear what had been said in regard to the effect of the treatment in late cases. In 3 cases coming under his observation, one a keratitis, one of periostitis of the tibia, and the third having both keratitis and bone changes, there was no effect obtained from the combined use of salvarsan and mercury, and he had thought that perhaps he did not know how to use the treatment.

DR. SAMUEL McC. HAMILL, Philadelphia, said that Dr. Warthin had been studying the question of the persistence of the spirochete in cases of cured syphilis which had given a negative Wassermann for several years. In such cases coming to autopsy he had found the spirochete in the testicle in nearly every instance, and he had drawn the deduction that syphilis was probably an incurable condition. He was asked the question, "In cured cases that become reinfected, if the spirochete persisted, what relation these spirochete had to the new infection?" This was interesting in connection with Dr. Veeder's point that one could not feel sure of a cure in these late cases.

ELECTION OF OFFICERS.

The following officers were elected for the ensuing year: President, Dr. George N. Acker, Washington, D. C.; Vice-President, Dr. Henry L. Coit, Newark, N. J.; Secretary, Dr. Samuel S. Adams, Washington, D. C.; Treasurer, Dr. Charles Hunter Dunn, Boston, Mass. Editor and Recording Secretary, Dr. L. E. La Fétra, New York; Delegate to the Association of American Physicians, Dr. Abraham Jacobi, New York; Elected to Membership in the Society, Dr. Frank Xavier Walls, Chicago; Dr. Philip Van Ingen, New York; Dr. T. DeWitt Sherman, Buffalo; Dr. Henry F. Helmholz, Chicago.

The place of the next meeting will be Cape May, N. J., May 25, 26, 27, 1915.

BOOK REVIEW

DISEASES OF THE NEWBORN. By AUGUST RITTER VON REUSS. Pp. 550. 22 marks. Berlin: Julius Springer, 1914.

The duration of the period termed "newborn" cannot be sharply defined. Roughly speaking, it lasts until the second or third week of life. Very little has been written about this period of an infant's life, either in pediatric or obstetrical text-books. For this reason a book such as Reuss has written should receive a hearty welcome.

Scattered throughout the book are very many instructive illustrations of diseases of the newborn. Reuss quotes very fully from the literature, his bibliography alone covering nearly forty pages. It is a pleasure to see that Reuss, unlike the greater number of German writers, is fully aware of the articles that have appeared in English during recent years. At the same time German and French literature is not neglected. One might say that Reuss gives almost too much credit to other observers, and does not put himself in the foreground often enough.

Space does not permit a review of each chapter of this excellent book. The article on breast feeding during the first few days of life is especially noteworthy. According to Reuss washing the breasts with a disinfectant before each feeding is unnecessary. The mouth of the infant should never be cleansed, because by this procedure ulcerations may result, which may be the point of entrance for infection. No food should be given during the first twenty-four hours after birth. If the infant is restless during this time, boiled water may be given, sweetened with saccharin, but not with sugar. No more than five or six feedings should be given during twenty-four hours, unless the infant is very weak, or drinks very little at each feeding, when seven feedings should be given. There should be a night pause of six to eight hours.

The chapter on diseases of the skin is very well covered and contains some excellent photographs illustrative of the various skin conditions in early infancy.

Many observers will not agree with Reuss when he says that some cases of gonorrheal vulvovaginitis can be cured in a few weeks. The treatment recommended by Reuss consists in cleanliness and irrigations of various antiseptic solutions.

The chapter on the care of the umbilicus and diseases of the umbilicus is intensely interesting and contains many instructive illustrations.

In the article on the hemorrhagic diseases of the newborn no mention is made of Welch's excellent results with large doses of human serum. Transfusion and injection of human blood and animal serum are recommended.

There is an article on infectious diseases and a very excellent treatise on tuberculosis and syphilis. Reuss has had good results with salvarsan in the treatment of congenital syphilis. The minimal dose is 0.05. Mercury is given in combination with this treatment.

The nervous diseases of the newborn are also very fully described in this book.

Reuss's "Diseases of the Newborn" covers the whole subject very thoroughly and should be read by all who are interested in the care and treatment of infants. JEROME S. LEOPOLD.

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ORIGINAL COMMUNICATIONS

THE SCHICK REACTION AND ITS PRACTICAL APPLICATIONS.

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AND

H. M. SEROTA, M.D.

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The results of immunizing injections and laboratory experience in testing the blood for antitoxin have shown that only those individuals contract diphtheria who have no antitoxin or only a minute amount in their blood and tissues. The methods previously in use for estimating antitoxin, and thus separating the susceptible from the non-susceptible individuals, have been too troublesome to be of practical value in routine cases. Schick[1, 2] has published recently a simple clinical test by which this can be accomplished. The reaction depends on the local irritant action of minute quantities of diphtheria toxin when injected intracutaneously. If antitoxin is absent, or present only in very small amounts, insufficient for protection, a positive reaction will appear in twenty-four to forty-eight hours. (See Fig. 1.) This is characterized by a circumscribed area of redness and slight infiltration which measures from 1-2 cm. in diameter. It persists for seven to ten days, and on fading shows superficial scaling and a persistent brownish pigmentation. The amount of toxin injected as advised by Schick is 1/50 MLD. for the guinea-pig in .1 c.c. of normal saline. We prefer 1/50 MLD. in .2 c.c.

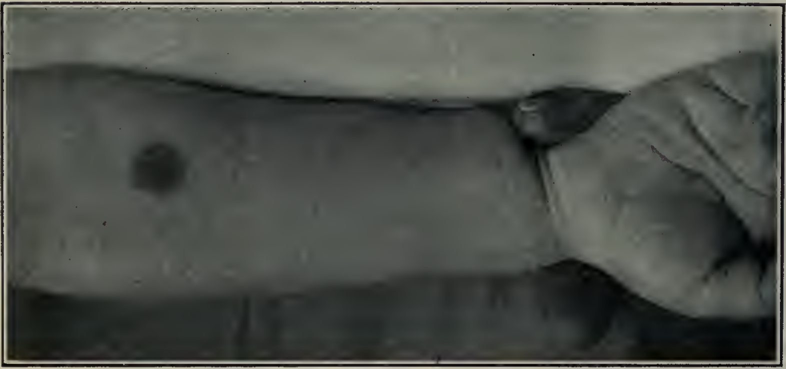

FIG. 1. Typical True Schick Reaction.

It is important to distinguish the true reaction from a pseudo-reaction (see Fig. 2), which is only found in a small percentage of older children and adults, who may have a large amount of antitoxin. These reactions are probably local sensitization phenomena of a general protein character, since similar reactions can be obtained with dilutions of nutrient broth or peptone solution in the same percentage as in the toxin dilution or a dialysate of the Klebs-Loeffler bacillus. The pseudo-reaction can be distinguished clinically by the trained observer in practically all cases from the true reaction. It appears earlier, is more infiltrated, less sharply circumscribed and disappears in twenty-four to forty-eight hours. It leaves only a faintly pigmented area, which, in our experience, never shows superficial scaling.

For the carrying out of the test it is essential to have an accurate syringe with a sharp but short-pointed, fine needle. The usual 1 c.c. "Record" tuberculin syringe with a fine platinum iridium needle answers the purpose well. A standard diphtheria toxin is diluted at first 1:10 in 0.5 per cent. phenol; this dilution will keep in the ice-box with little deterioration for at least two weeks. For use further dilutions are made in normal saline, of such strength that .1 or .2 c.c. contains 1/50 MLD. for the guinea-pig. As already stated, Schick prefers .1 c.c., while we prefer .2 c.c. This amount is injected intracutaneously on the flexor surface of the arm or forearm. The persistent pigmentation may make the forearm objectionable; in such cases the surface of the arm may be chosen.

Though the intensity of the reaction varies in different individuals, a well-marked redness indicates an almost complete absence of antitoxin. Faint reactions point to the presence of very small amounts of antitoxin, which are not sufficient, however, to certainly protect the individual against diphtheria. To prevent the appearance of the reaction, according to Schick, at least 1/30 unit of antitoxin per c.c. of blood is required. This amount he considers sufficient to protect against diphtheria. According to v. Behring, even as little as 1/100 unit of antitoxin will protect against the disease in uncomplicated cases. In a child three years of age, weighing 35 pounds, we found that 10 units of antitoxin were sufficient to prevent the appearance of the Schick test when made twenty-four hours after the injection of antitoxin.

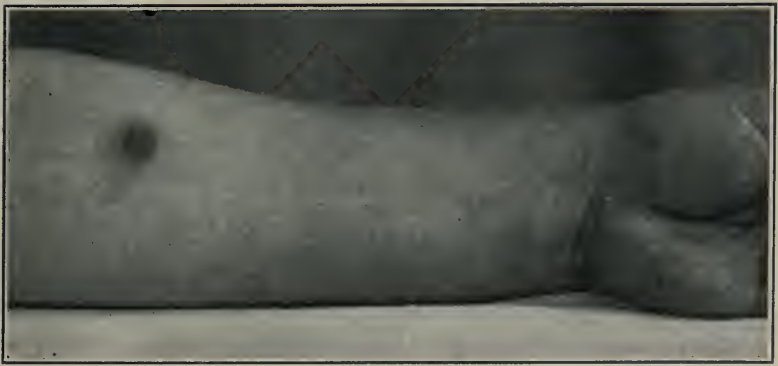

FIG. 2. Typical Pseudo-reaction.

The Schick reaction was carried out during the past six months on all patients entering the scarlet fever pavilion of the

Willard Parker Hospital. In all, 700 patients were thus tested, and of these, 400, or 57 per cent., gave negative reactions. Only cases giving positive reactions were immunized; those giving a negative reaction received no immunization, but were carefully observed. Although more than a quarter of the negatively reacting patients became bacillus carriers during their stay in the wards, no cases of clinical diphtheria developed among them.

The remaining 300 patients who gave positive reactions received in practically all cases some form of toxin-antitoxin mixture. Among those who reacted insufficiently to the attempt at active immunization with toxin-antitoxin mixtures 42 developed clinical diphtheria; of these, 20 were nasal, 20 tonsillar and 2 laryngeal diphtheria. The great majority of the cases were of a mild type.

According to ages, the number of reactions obtained were as follows:—

Age	Total	— Schick	+ Schick	% + Schick
6 months to 1 year	5	3	2	40 %
1 " 2 years	40	14	26	65 "
2 " 4 "	145	48	97	66.8 "
4 " 6 "	142	71	71	50 "
6 " 8 "	94	61	33	35.1 "
8 " 15 "	150	111	39	26 "
15 years and over	124	93	31	33 "
	700	400	300	43 %

The percentage of individuals susceptible to diphtheria is greatest, therefore, between the ages of one to four years. It is less during the second six months of life and less in older children and in adults. These results closely approach those obtained by Schick, whose table shows positive reactions in 7 per cent. of the newborn, in 43 per cent. during the first year of life, in 63 per cent. between two and five years and 50 per cent. between five and fifteen years. In adults the positive reactions were not more than 10 per cent.

During systematic testing of groups of children belonging to one family, we were impressed with the frequency with which all the children of the same family gave a similar reaction. If variations were found, the younger children always gave the positive reactions. If the youngest child had a negative reaction all the older children were also negative. On the other hand, if the oldest child in a family gave a positive reaction, the younger children always showed positive reactions. These striking facts lead us to believe that there are other factors in addition to abortive infections with the Klebs-Loeffler bacillus (v. Behring, Kleinschmidt) which give rise to the presence of the so-called natural antitoxin. The large amount which is present in some of the cases is hard to explain; for example, two young children, six and one-half and three years of age, who had no history of clinical diphtheria, showed respectively fifteen and nineteen units of natural antitoxin per c.c. of serum. The large proportion of adult persons having antitoxin adds to the difficulty of considering the natural antitoxin as due to a previous infection as a case or as a carrier.

With this test Schick attempted to place on a more rational experimental basis some interesting clinical problems in connection with the prophylactic and therapeutic dosage and mode of administration of antitoxin. By making the test at regular intervals previous to the injection of antitoxin, he found that a dissociation of the union between the toxin and tissue cells, or, at least, neutralization of toxin in contact with them, was still possible up to a certain number of hours. This dissociation was rendered visible by the partial or complete suppression of the reaction. The efficiency of the injected antitoxin depended on the mode of administration and the size of the dose. He thus showed that the intramuscular injection was more efficacious than the subcutaneous one; that 1,000-2,000 units of antitoxin injected at the time the Schick test was made prevented the appearance of the simultaneous reaction. To suppress, however, the reaction when the test was made two hours before the administration of antitoxin, a very much larger dose was needed, while for the six-hour test even excessively large doses (up to 16,000 units) were insufficient to prevent the appearance of the reaction.

We carried out some parallel experiments, attempting at the same time to see approximately how much more effective the same dose of antitoxin was when given intravenously than when given subcutaneously or intramuscularly. The Schick test was made six hours, four hours and two hours before and at the time of the injection of the antitoxin. Comparing the results obtained from 100 units given intravenously with those obtained when the same amount was injected subcutaneously, we found that when injected intravenously the antitoxin weakened the reaction made two hours before and prevented the appearance of the simultaneous reaction; given subcutaneously, no effect was noted after 100 units on the two-hour reaction, and little, if any, on the simultaneous test. With 1,000 units given intravenously even the six-hour reaction was considerably weakened, though not entirely suppressed. The four-hour reaction appeared very faint, while the two-hour reaction was negative. 1,000 units given subcutaneously, however, had no effect on the six and four-hour reactions, weakened the reaction made two hours before, while the simultaneous reaction was just visible. The same amount (1,000 units) given intramuscularly had a somewhat stronger effect than the subcutaneous injection, and prevented the appearance of the simultaneous reaction.

To obtain the same effect on the Schick reaction with the subcutaneous as was obtained with the intravenous injection of antitoxin, from ten to twenty times the amount was needed; 20,000 units given subcutaneously were able to affect the six-hour reaction to the same extent as 1,000 units given intravenously. In very toxic forms of diphtheria, therefore, where a large amount of toxin has already come in contact with the cells of the body with a resulting greater or less amount of fixation, large doses of antitoxin (10,000-20,000 units) should be given intravenously to neutralize as much as possible the effect of such partially-fixed or contact toxin.

DISCUSSION AND CONCLUSIONS.

(1) The Schick reaction served as a reliable and convenient index of the susceptibility or non-susceptibility of individuals to diphtheria.

(2) It served, also, as an accurate clinical test to determine the efficiency of active immunization with mixtures of diphtheria toxin and antitoxin.

(3) It has helped us in the diagnosis of clinically doubtful nasal diphtheria. With a purulent or sanious discharge showing the Klebs-Loeffler bacillus it is difficult to decide whether the case is a carrier or a beginning diphtheria. A negative reaction excluded clinical diphtheria, while a positive Schick reaction left the diagnosis of clinical diphtheria still a probability.

(4) It has added further experimental proof to the clinical experience that very toxic cases of diphtheria require the early intravenous administration of large doses of antitoxin.

(5) The results obtained in families seem to point to other causes in addition to bacterial infections with virulent diphtheria bacilli as determining factors in the production of natural antitoxin.

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2. Schick (B). "Die Diphtherietoxin-Hautreaktion des Menschen als Vorprobe der Prophylaktischen Diphtherieheilseruminjektion," München. Med. Woch., 1913, LX., 2,608-2,610.

A NEW STAIN FOR TUBERCLE BACILLI.—F. Mas y Magro (ref. *Muench. med. Woch.*, 1913, No. 6, p. 319). The stain is as follows:—

(1) The sputum is spread on a slide and dried.

(2) Fixation in the flame or by half an hour at 120°C.

(3) Stain for three minutes in Gosio's stain, warming three or four times until a light steam arises. Gosio's stain consists of methylene-blue medic. Hoechst 3.0, borax 5.0 distilled water 100.0. The solution must be old or have been kept uncovered in a thermostat at 37°C. for several days with frequent shaking.

(4) Place the specimen for three to four seconds in 25 per cent. sulphuric acid and

(5) For forty seconds in absolute alcohol.

(6) Dip into a mixture of equal parts of Elsbach's solution and absolute alcohol.

(7) Wash in hydrant water; dry.

(8) Decolorize in a solution of 50 per cent. alcohol 100.0, sodium hydrate 0.5, potas. iodid 1.0.

(9) Wash first with hydrant, then with distilled, water.

(10) Dry and mount.

This method stains the tubercle bacilli a rosy red, their intrabacillary granules dark red, all other bacteria and cells blue. It is said to surpass all previous methods.—*Interstate Medical Journal.*

TREATMENT OF RECURRENT SIBILANT BRONCHITIS.*

BY B. K. RACHFORD, M.D.

It is my belief that the symptom groups commonly described in medical literature under the titles, Migraine, Recurrent Vomiting, Recurrent Sibilant Bronchitis, Recurrent Coryza, Asthma and Urticaria, as they occur in children, are, as a rule, closely related food intoxications which can be successfully treated by very much the same dietetic and medical treatment.

In a paper read before this society in 1897[1], I expressed very much the same views that I am reiterating to-day. In that paper, under the title "Lithemic Vomiting," I reported cases which are now known as recurrent vomiting and called attention to the fact that recurrent vomiting attacks may not infrequently, as the child grows older, be transformed into attacks of true migraine. In the seventeen years which have intervened I have become more than convinced that the clinical statement I then made is true. In that same paper I spoke of the toxic dyspnea which may be present in these cases. I also described in these same cases acute gastrointestinal attacks associated with diarrhœa, which recur without apparent cause at more or less regular intervals, and hazarded the belief that the diarrhœa in these cases was eliminative and therefore a curative symptom. At the same time I also expressed the belief that urticaria might be an expression of these same autointoxications.

In 1909 Dr. Frederick A. Packard, under the title "Urticaria of Mucous Membranes," presented to this society the then existing clinical evidence of the mutual relations of asthma and urticaria.

Dr. Charles Gilmore Kerley has for a number of years been especially interested in the close etiological relationship which exists between the above-named symptom groups and has insisted that the treatment of all of these disorders should be along similar lines.

It is not my purpose at the present time to express an opinion as to the character or the method of action of the various toxins which may bring about the above-named symptom groups. The special objects of this paper are:

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* Read before the annual meeting of the American Pediatric Society, Stockbridge, May 26-28, 1914.

[1] Transactions of American Pediatric Society, 1897.

First.—To call attention to the clinical fact that recurrent rhinitis and recurrent sibilant bronchitis, which are sometimes associated with rather severe asthmatic attacks and almost always with a severe paroxysmal cough are very commonly caused by some kind of food intoxication.

Second.—To direct attention to the fact that recurrent attacks of rhinitis and whistling bronchitis, which is one of the most common symptom groups the physician is called upon to treat, may be in most instances almost or quite relieved by dietetic treatment.

Third.—To insist that this symptom group occurs not infrequently in children who have a predisposition to migraine, recurrent vomiting and urticaria. In the case histories given below this relationship is shown.

The successful treatment of these various syndromes is very similar and varies but slightly from that which I recommended in 1895[1] and 1903[2].

TREATMENT OF RECURRENT RHINITIS, RECURRENT SIBILANT BRONCHITIS AND ASTHMA IN THE CHILD

Dietetic Treatment of Attack.—During the attack sweets, butter fats, eggs and raw fruits are especially to be avoided. Strawberries, rhubarb, tomatoes, salads, shell-fish, tea, coffee, pastry, gravies, cream, cod-liver oil and alcohol are excluded from the diet. If it be necessary to sweeten the cereals and cooked fruits which the child eats, saccharin is to be used for this purpose instead of sugar, and while the patient is not to have butter, skimmed milk may be allowed. Eggs in every form, even in cooked foods, are to be carefully eliminated from the diet, and among the raw fruits, oranges are to be especially avoided.

The following foods may be allowed: beef, mutton, fowl, and fish in moderation, cereals, bread, all vegetables not above proscribed, cooked fruits, skimmed milk and thick soups.

Interval Dietetic Treatment.—About two months after the patient has recovered from the attack the above diet may be carefully modified by adding one egg a day to the diet, then perhaps two weeks later, milk containing 4 per cent. fat may be substituted for skimmed milk. Some few weeks later all raw fruits, oranges excepted, may be added to the diet. Some weeks later, small quantities of sugar may be used for sweetening cereals and stewed fruits. After five or six months the child may return to his original diet with the exception that he must eat sparingly of sweets and must eat nothing between meals. If the symptom group returns on the addition of any article of diet that particular food is to be permanently excluded from the diet.

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[1] *Medical News,* September 7, 1895.

[2] "Treatment of Migraine." Transactions of the Association of American Physicians, 1903.

Hygienic Treatment.—During the attack the patient is to have all the outdoor air he can get with as little exercise as possible; this can be obtained on sleeping porches and with wide open windows. As he recovers from his attack, exercise in the open air is advisable. It is especially important that school children, who must necessarily spend a portion of their day in the close atmosphere of the schoolroom, should have all of the air possible at night.

Medical Treatment of the Attack.—During the attack, constipation should be relieved by some of the magnesium salts[1]. The milk of magnesia or calcined magnesia are especially suitable for this purpose. Sulphate of magnesia may be used in small doses in older children.

Alkalies in the form of bicarbonate of soda, bicarbonate of potash or citrate of potash should be given in fair sized doses three or four times a day. Bicarbonate of soda may be given for example in 5-grain capsules three or four times a day, or the same size dose of citrate of potash may be given in solution. In younger children who object to the taste of bicarbonate of soda I commonly direct the mother to distribute through the child's food a teaspoonful of this salt each day.

Tincture of belladonna should be given for a short time in 2 to 4 minims doses three times a day.

Interval Medical Treatment.—If constipation cannot be controlled by diet some form of cascara or other palatable laxative should be used as indicated. The belladonna is discontinued, but an alkali in some form should be given for six or eight weeks. Bicarbonate of soda is the best alkali for this purpose and may be given in moderate sized doses once or twice a day.

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[1] Martin Fischer has taught us that the magnesium salts when given with such alkalies as soda and potash help to fix these alkalies in the tissues.

The above treatment, if faithfully carried out, will in almost every instance control the syndrome above described. This treatment is almost or quite as effective in the treatment of migraine and recurrent vomiting in children. In the adult and older child, I continue to use in the treatment of migraine the formula which I originated twenty years ago, and which has been published many times. It is as follows[1]:

Sodii sulphatis (dry)	30 grains
Sodii salicylatis (from wintergreen) ...	10 "
Magnesii sulphatis	50 "
Lithii benzoatis	5 "
Tincturæ nucis vomicæ	3 drops
Aquæ distil, to make	4 ounces

This prescription is put up in siphons and charged with carbonic acid, and the patient is directed to take, half an hour before breakfast, a sufficient quantity to produce at least one bowel movement during the morning. This prescription is a remedy of great value in the preventive treatment of migraine; it may, in fact, replace all other medication.

CASE I.—Male, age 10. Family history good, except mother has migraine; two other children are well. Patient began to have attacks of recurrent vomiting when two years of age. For a few years these attacks were frequent and severe and were accompanied by a severe acidosis. Acetone and diacetic acid were found in the urine on first day of attack and continued until after the vomiting ceased, somewhere between the fifth and ninth day of the attack. Up to the time he was five years of age, these attacks grew more frequent and more severe and his general physical condition was far from satisfactory. He was thin, undersized and lacked strength. He suffered frequently from rhinitis and bronchitis. After five years of age his attacks of recurrent vomiting were less frequent and less severe. Between seven and ten years of age he did not suffer from recurrent vomiting, but during this time he had frequent attacks of bronchitis, characterized by severe coughing and by whistling râles.

September 15, 1913, he became ill with a severe coryza, mild pharyngitis and whistling bronchitis. He had fever and was put to bed. He was given five grains of potassium citrate and two grains of tincture of belladonna. For six weeks he continued to manifest the symptoms incident to coryza, pharyngitis and bronchitis. At times he had no fever, little cough and seemed on the point of convalescence, when suddenly, without apparent cause, there would be an acute exacerbation of all his symptoms and he would go to bed again as ill as before. During this time he had careful local treatment of the nose and throat and such internal treatment as his general symptoms demanded. The internal treatment consisted largely of tincture of belladonna and some alkali. On November 1st he suddenly developed a violent urticaria. His body was covered with large red urticarial wheels. He suffered intensely from itching, he was sick at his stomach, his breath had an acetone odor and his urine contained acetone and diacetic acid. Coincident with the development of the urticaria, his coryza, pharyngitis and bronchitis disappeared.

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[1] "Diseases of Children," Rachford. D. Appleton & Co., 1912.

As I studied the various symptom groups which this patient presented during his illness, I became convinced that he was suffering from some kind of food poisoning and that these poisons, whatever might be their nature, by their action on different parts of the vasomotor nervous system, produced from time to time the symptoms of recurrent vomiting, recurrent coryza, recurrent bronchitis and urticaria.

Acting upon this hypothesis I placed the patient on the following treatment: I excluded from his diet all sweets, including sugar, all butter fats (including milk), eggs in every form and raw fruit juices, especially oranges. He was allowed soups, cereals, meat, bread and vegetables. The medication consisted of a teaspoonful of bicarbonate of soda every four hours and a sufficient quantity of milk of magnesia to keep his bowels open. Under this treatment he commenced to improve at once and was well within the week. From that time until the present writing, a period of four months, he has been kept practically upon the same diet and has remained perfectly well.

CASE II.—Male, age eight. Family history: paternal grandmother died of tuberculosis, father has hay-fever, mother suffers from migraine. Two other children in the family are well and show no tendency to hay fever, asthma, or autotoxic attacks.

Patient is a boy of fair physical development. He enjoyed good health until eighteen months ago, when he developed a whistling asthmatic bronchitis, from which he suffered more or less for nine out of the subsequent twelve months. During this time he had more or less severe attacks of asthmatic bronchitis characterized by great difficulty in breathing and incessant coughing; these symptoms were worse at night. From these severe attacks he would, after a short time, sufficiently recover to return to school. But during all of this time, even when he was well enough to go to school, he continued to have whistling râles and a more or less irritating cough with shortness of breath on exercise. He lived in the open air and slept on a sleeping porch during all this time. During the summer of 1913 he had an attack of what his parents believed to be hay-fever. During this time, the last three weeks of August, he suffered severely from asthma. Following this attack in August he remained in comparative good health until the middle of October, when again he suffered severely from a whistling bronchitis, associated with an irritable and paroxysmal cough and both night and day his breathing was labored and his chest was filled with whistling râles.

When I saw him for the first time on October 29, 1913, he was suffering as above described. With his asthmatic symptoms, however, he had no fever and so far as I could learn, his attacks had always been afebrile, except when complicated by influenza during a household epidemic of this disease.

Treatment.—The treatment was the same as in the preceding case—sweets, butter fats, eggs, oranges and all raw fruits were eliminated from his diet. He was given bicarbonate of soda three times a day and in addition five grains of potassium citrate and two minims of tincture of belladonna. This boy was allowed skimmed milk, bread without butter, cereals without sugar or cream, all meats and vegetables and certain cooked fruits. His cereals and cooked fruits were sweetened with saccharin.

Six days later this boy was absolutely well and his general appearance was much improved. The diet and bicarbonate of soda was continued and the boy returned to school and continued to sleep as he always had done in the open air at night. He remained perfectly well until Christmas week, a period of about two months, when he went off his diet, eating sweets, eggs, butter fat and raw fruit. Within four or five days all of his asthmatic symptoms returned. He was again placed upon the same treatment as before, and he as quickly recovered, returning to school perfectly well after the holiday vacation. He remained perfectly well again for two months, and then again went off his diet, with the result that the asthmatic symptoms again returned. These asthmatic symptoms lasted only a few days after he was again placed upon his diet. From that day to the present he has continued his diet and remained quite free from asthmatic symptoms.

Case III.—Female, age four years. When five months old she had an attack of whistling bronchitis associated with a severe paroxysmal cough and during the attack vomited a number of times. This attack lasted about three days. She had similar attacks at the ages of thirteen months, fourteen months, seventeen months and two years. From that time on during the past two years her attacks have been more severe and more frequent. During the winter of 1912-13 she had nine quite severe attacks within seven months, and during the summer of 1913 these attacks occurred about a month apart. Last August she had a very severe recurrent vomiting attack associated with a wheezy bronchitis and a severe paroxysmal cough. This attack lasted six days, and during this time almost nothing was retained on the stomach. She had similar attacks September 20 and October 20, 1913.

November 16, 1913, she began to cough and quickly developed a severe whistling bronchitis with such alarming symptoms that her parents thought she would die from suffocation during the night. On the 17th the cough was somewhat less paroxysmal and the asthmatic symptoms less severe, but at this time she became sick at her stomach and vomited frequently during the afternoon and night of the 17th; in fact, nothing stayed on her stomach for twenty-four hours.

On November 18th I saw her for the first time and obtained the above history and I also learned that in the intervals between the attacks above described she was at no time entirely free from cough, and had most of the time whistling sounds in her chest.

When I saw her she was suffering from a whistling bronchitis with marked difficulty in breathing, but the persistent vomiting had apparently subsided. The mother made the observation that during her attacks she suffered either from severe vomiting or from great difficulty in breathing. When the vomiting was severe the asthma would be relieved and vice versa. The urine of this patient contained acetone and diacetic acid.

Treatment.—A diet similar to that outlined in the previous cases was prescribed. She was also given milk of magnesia, bicarbonate of soda, citrate of potash and tincture of belladonna. The patient entirely recovered within a few days and from that day to the present writing the diet has been continued and small doses of bicarbonate of soda given every day.

From that day to the present (a period of over four months) this patient has remained perfectly well.

CASE IV.—Male, age eight years. This boy has for two years suffered from typical attacks of true migraine. He has recurrent self-limited attacks of severe paroxysmal headaches, usually unilateral, always accompanied by nausea, vomiting and vertigo. He goes to bed with these attacks and remains there one or two days. These symptoms are followed by a long and profound sleep from which the patient awakes free from pain. The urine during these attacks commonly contains acetone.

During the past few months he has had these attacks almost every week and during the past week he has had three severe headaches. He is slightly constipated, occasionally demanding a laxative. The eyes, naso-pharynx and genital organs have been carefully searched and no reflex factors found. On inquiry, I learned that this boy eats from two to four eggs a day, drinks three glasses of rich milk and eats largely of sweets, including large quantities of sugar, and has oranges or grape fruit for his breakfast. He eats almost no vegetables, stewed fruit, very little meat, except bacon for breakfast, and cannot be induced to take bread without large quantities of butter.

Treatment.—For this patient I prescribed the same diet outlined above. He was to have absolutely no raw fruit, no eggs, no butter and as little sweets as possible. I also prescribed one-half teaspoonful of bicarbonate of soda three times a day and a teaspoonful of milk of magnesia night and morning. His mother thought it would be absolutely impossible for him to get on with the above diet. I, however, insisted and told her if he could not eat the prescribed foods to let him go without eating. Six weeks later this boy, who had not had a moment of illness during that time, was greatly improved in his general appearance. He was eating meat, vegetables, cereals, skimmed milk, bread and cooked fruits. I then allowed him one egg a day and three glasses of certified milk, which contains 4 per cent. fat. Two months later this boy is perfectly well, is satisfied with his diet, has had no headaches and has greatly improved in his general health. He has gone to school all of the time. He still continues to take 5 grains of bicarbonate of soda three times a day and an occasional dose of phosphate of soda or milk of magnesia to move his bowels.

FINKELSTEIN'S FOUNDATIONS.*

A REVIEW OF ARTICLES APPEARING IN *Jahrbuch für Kinderheilkunde,* BD. 65–68.

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The term alimentary intoxication refers to all those toxic states occurring during the course of nutritional disturbances which are characterized by a tendency to collapse, loss in weight and symptoms on the part of the nervous system. The best known of this group is intestinal catarrh, the usual severe cholera infantum.

The essential symptoms and signs of alimentary intoxication are nine in number:—

(1) Disturbances of consciousness.
(2) Changes in respiration.
(3) Alimentary glycosuria.
(4) Fever.
(5) Collapse.
(6) Diarrhea.
(7) Albuminuria and cylindruria.
(8) Disturbances of the weight curve.
(9) Leukocytosis.

Only three of these need further explanation.

(*a*) The respiration in a typical case is similar to that of diabetic coma, an essential air hunger.

(*b*) The sugar found in the urine is lactose or galactose.

(*c*) The leukocytosis is moderate (30,000), but is a constant feature and is absent in the other nutritional disturbances.

According to the predominance of one or another set of symptoms, we may distinguish several types of alimentary intoxication:—

(1) Choleroid type, which is characterized by marked loss of water, and collapse with few cerebral symptoms.

(2) Hydrocephaloid type, which resembles acute hydrocephalus in its symptoms.

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(3) The soporific type, which is characterized by a tendency to coma.

(4) Asthma dyspepticum, in which respiratory symptoms are prominent.

For the diagnosis of alimentary intoxication the observation of the facies and general behavior are important, especially in the early cases. The appearance of children suffering from this disorder is fairly characteristic and is largely dependent upon the circulatory and cerebral disturbances. The child is drowsy, and hard to awaken; he is especially quiet; the lids are half closed, or, if open, the glance is languid and lost in the distance, or staring. The lively play of the features of the healthy child has given place to a mask-like expression; the quick angular movements are replaced by rounded pathetic gestures; there are deep shadows about the eyes, and deep lines on the forehead and about the mouth and eyes. The color is a transparent sallowness beneath which there is a slight lividity. In the severe cases coma, delirium, catalepsy, spasms, with meningeal symptoms, and paralysis may occur.

After the facies, the most important things in diagnosis are breathing and the glycosuria, which are pathognomonic. Differential diagnosis is easy on account of the characteristic nature of the findings in alimentary intoxication. It resembles diabetic coma more closely than anything else. This would be found rarely in infancy and the sugar of diabetic urine is glucose not lactose, as in alimentary intoxication.

Occurrence.—Alimentary intoxication occurs:—

(1) In the course of acute and chronic nutritional disturbances.

(2) In the course of gastroenteritidies.

(3) During the acute infections of parenteral origin, sepsis, measles, pneumonia and scarlet fever; that is, it occurs during the course of any disease which influences the organism as a whole, when the injury to the organism has reached a sufficiently high grade. It is useless, therefore, to seek the cause of intoxication in any characteristic of one of the primary diseases during which it occurs; for it is manifestly the expression of some reaction on the part of the organism. The following facts indicate that it is a severe disturbance of metabolism.

During alimentary intoxication (1) there is an insufficient carbohydrate oxidation; (2) dependent on this acidosis occurs; (3) there is a toxic decomposition of albumin, excess of urea is eliminated; (4) glycocoll is not oxidized (severe case); (5) Benzol is not changed into phenol.

These things indicate that there is a marked reduction in the power of oxidation. Alimentary intoxication is therefore a severe disturbance of metabolism somewhat analogous to diabetic coma and uremia.

Finkelstein's study of intoxication comes under three main headings:—

(1) The study of the disturbances on which it is based.

(2) Its genesis.

(3) The nature of the poison producing the toxic symptoms.

The first class of diseases mentioned as a basis for alimentary intoxication are referred to as nutritional disturbances. In order to make this term represent a clinical entity the only diseases referred to as nutritional disturbances are those in which every symptom may be explained on the grounds of a disturbance of the nutritional process. Diseases associated with infection of the intestinal wall, such as dysentery for example, are not included. The symptoms, however, are so similar that it is necessary to prove that infection is a factor in the disturbance in order to show that the fever is not dependent on the diet or that there are inflammatory changes in the intestinal wall.

Finkelstein first busied himself with the nature of the poison in alimentary intoxication. He argued that any explanation must conform to the clinical facts and raised the question, Are there any such regular relations between clinical observations and the appearance of intoxication that they allow of any conclusions being drawn? All investigations in this direction were found to be negative except one. It has long been known that there is a great deal of interdependence between the diet and the toxic symptoms. This knowledge has so far, however, been used only for therapeutic purposes.

The clinical facts: No intoxication comes out of a clear sky; it is always preceded by a prodromal stage in which dyspeptic stools, disturbances of the weight curve, and irregular temperature occur.

The influence of the diet upon the appearance and course of alimentary intoxication may be discussed under three headings:—

(1) *Amount of Food.*

If a child in the prodromal stage of intoxication be given an increased amount of food, this is usually the occasion of the outbreak of intoxication. Intoxication may almost be produced at will in dyspeptic children by giving large amounts of food. Withdrawal or decrease in the amount of food during the prodromal stage usually prevents the onset of intoxication.

Cases which have developed intoxication may be divided into three groups on the basis of their reaction to the withdrawal of food and giving of normal salines or tea for a short time in its place.

Group 1. Complete cure in twenty-four or forty-eight hours.

Group 2. Reduction of fever at once—cure after several days.

Group 3. No effect whatever.

During convalescence a too rapid increase in the amount of food often produces a relapse.

(2) *Effect of Kind of Food.*

Sugar seems especially liable to cause intoxication; its reduction improves the condition. Fat, however, also seems to bear some relation to intoxication if given in amount exceeding toleration. The administration of very small amounts of fat may cause the outbreak of intoxication, increase its severity, or cause a relapse, depending on when given, and the rapidity with which it may do this is often startling. The fat of woman's milk acts in nearly the same way as that of cow's milk, and in treating intoxication it is often necessary to centrifugalize the breast milk to remove the fat. However, fat does not affect symptoms except during development, course or decline of intoxication; and diets rich in fat and poor in sugar never give rise to intoxication. Casein seems to have no effect on the condition whatever.

(3) *Influence of Condition of Child.*

The condition of the child is just as important as the amount or character of the food, for it is evident that the relation between diet and symptoms described can only occur in a child who is sick and sick in a certain way. Some inner change is present in the organism, which only becomes evident in toxic symptoms when certain conditions are brought about by changes in the diet. The condition of the child is a very variable factor. It not only varies in different cases but in the same case from day to day and even from hour to hour.

These facts show clearly that intoxication is not an infective process, for no infection would show so much dependence on the diet. We must conclude from these clinical facts that "intoxication is of alimentary causation and that it occurs at that moment when a child, ill in a certain way, receives larger amounts of food or of a single foodstuff than his lessened tolerance can take care of in a normal way." Further, we may conclude that sugar is principally to blame, together with fat, for the occurrence of intoxication. Fat produces harm under certain conditions which are not necessary to sugar. Casein and whey are not implicated so far as can be made out.

May we conclude anything from these facts as to the nature of the poison producing the toxic symptoms? It is certain that intoxication is not an infectious process. May it be due to products of bacterial decomposition of food? Against this we have the following facts:—

(1) That the derangement in metabolism is very marked with relation to symptoms and signs, which is not true where bacterial products are at work.

(2) A certain definite degree of illness is necessary before intoxication can set in.

(3) No characteristic flora is found in the intestine.

(4) Casein, the decomposition of which would be most likely to produce poisons, has no effect on the condition, and evidence of proteid decomposition, alkalin stools, is absent in most cases.

Therefore bacteria have nothing to do with the production of alimentary intoxication.

Because of the close relation of intoxication to the diet and because of its other clinical peculiarities, Finkelstein, following Czerny, believes that the symptoms of intoxication are the expression of an alimentary poisoning due to the abnormal fate of the food during intermediary metabolism. In support of this Schrapp has found that sugar when injected subcutaneously may produce vomiting, fever and other toxic symptoms.

Acidosis is a constant finding in intoxication and it might be suggested that intoxication is an expression of this and is similar to coma diabeticum. Strong arguments against this theory have not yet been brought forth. The fact that starvation which produces acidosis affects intoxication favorably, loses its effect when one remembers that the decision depends on quantitative relationships. The theory has not a great deal to substantiate it, however, and for the present the nature of the poison cannot be definitely decided, except that it is metabolic in origin.

The clinical facts show clearly that food may act as a poison, on account of an abnormal fate during intermediary metabolism, without the intervention of bacteria, and this fact may prove very important not for pediatrics alone, but also for general pathology. However, food can only produce poison in this way when the metabolism is deranged. At base there is a general insufficiency of the functions which have to do with food and its assimilation.

Unity of Nutritional Disturbances.—The complete bankruptcy of the assimilative powers seen in intoxication is the result of previous disturbances of the nutritional functions. These may take place so rapidly or may be drawn over such a long period that they are not always recognizable, but they are evident in a sufficient number of cases to make it plain that intoxication is only a stage of a disturbance which is unity and of which all nutritional disturbances are only forms. What speaks above all for the truth of this is that different disturbances can be transformed one into the other.

To understand these conditions which are disturbances of functions, we must pursue methods which are aimed at the study of functions. To do this one must consider the nutritional process—digestion, repair and growth on the one hand, and on the other the end result of the nutritional processes of the body with reference to its material and functional condition. Of first interest is the nutritional condition, and with this the nutritional energy. The things are interdependent. The nutritional energy is dependent on the nutritional condition. The nutritional process is dependent on the energy and is responsible for the nutritional condition. To determine whether or not a nutritional disturbance is at work we examine the nutritional energy, which is done by testing the nutritional process. We give the organism a definite nutritional task and observe any departure from the normal while this is being accomplished, much as the pharmacologist watches the effect of a drug. The food is the stimulus, the nutritional process the biological reaction. From the effect of the food, the effect of which on the normal is known, conclusions may be drawn as to the nature of the process. This method allows us to determine what disturbances are nutritional in nature, and it also allows us to classify these chiefly on the basis of the reaction to food.

We may judge of the decomposition processes which produce heat by the temperature. We may judge of the building process by the weight. We may judge of the nutritional condition of the various organs, heart, kidney, etc., by the functional activity. Pulse, respiration and urine are as important in the reaction to food as manifestations on the part of the intestinal canal.

The Normal Reaction to Food.—When the giving of food or the change in diet produces no deviation from the normal in pulse, weight curve, temperature, respiration, urine, etc., that is, affects a child favorably, the reaction is normal. Reactions which deviate from the normal—food which affects a child unfavorably or is useless to him—are called paradoxical.

GENERAL SIGNS OF NUTRITIONAL DISTURBANCE.

Evidence of Health.—Evidence of functional activity of the intestine is obtained from muscle power, psychical and nervous activity, respiration, circulation and immunity.

Perfect regulation of the oxidation process causes a very regular temperature curve. There should not be variations of more than .6°C. The increase in weight should be up to the average and the weight curve should rise steadily, with only slight deviations. The final test is the test of the physiological tolerance breadth of the nutritional function. This is much greater in healthy children, who react favorably to all kinds of mixtures within wide limits. The difference between the physiological requirement and the amount which will cause the maximum gain in weight is very great. A normal child undergoes a change in diet without abnormal symptoms and gains weight rapidly when his food is increased in amount.

Evidence of Nutritional Disturbance.—Any nutritional disturbance must affect the nutritional process and therefore the end product. No nutritional disturbance can occur without affecting the whole organism. The child is pale, the temperature is irregular, the weight is disturbed, and, most important of all, there is a marked decrease in the food tolerance. The different grades of loss in tolerance and the different manners of reaction to like nutritional influences enable us to divide nutritional disturbances into four groups:—

(1) *Balance Disturbance.*—Here we find the general bodily condition and the rapidity of growth somewhat below par. The breadth of tolerance toward food is decreased only slightly. The child reacts normally to physiological requirement. Increase in food produces less increase in weight than in normal and changes in diet are liable to influence the child unfavorably.

(2) *Dyspepsia.*—Tolerance is so far reduced that the child is only free of symptoms when food is down to the energy line. Increase in the food produces a paradoxical reaction in the shape of abnormal stools and temperature disturbance.

(3) *Decomposition.*—Tolerance is very much reduced. Food produces rapid progressive loss of weight. Tolerance toward fat is most markedly reduced, later tolerance to sugar also. Subnormal temperature, and irregularities of the respiration with slowed pulse are present.

(4) *Intoxication* (which has already been described).—The nature of these disturbances must now be more carefully investigated. It will be seen from what follows that manifold as the symptoms and signs of the nutritional disturbances are, they all have their basis in two pathological processes, which are clinically direct opposites. The first of these is alimentary intoxication with its predominance of toxic symptoms, the other is decomposition in which toxic symptoms are entirely absent. Balance disturbance and dyspepsia are only the prodromal stages in the history of alimentary decomposition.

Balance Disturbance.—This stage is so-called because its chief clinical characteristic is the deficiency of the end result of the nutritional process; that is, the child's general condition is below normal. Changes in the gastrointestinal tract are not demonstrated by clinical methods. The heart and other organs show no disturbance. The weight increases but not as much as normally and the weight curve shows a great many ups and downs. If the child is kept on an amount of food which just exceeds the physiological requirement, it does not deviate from the normal. It is only when larger amounts are given that the diminished power of its metabolism becomes evident. Investigation of the different foodstuffs shows that the tolerance for fat is most markedly diminished. The carbohydrate tolerance is good at first, but gradually diminishes. If a larger amount of food is given to a case of balance disturbance to make the weight curve steeper dyspepsia results.

Dyspepsia.—Dyspepsia is a stage of endogenous intestinal fermentation caused by a disproportion between the amount of food and the power of metabolism. That essential regulatory power is lacking which enables the healthy child to maintain the normal composition of the intestinal flora and the normal chemistry of the intestinal contents. Abnormal fermentations gain a foothold and the presence of these with the consequent effect upon the motor and secretory activity of the intestine gives rise to the symptoms of dyspepsia. The disease is a local one; only those processes within the intestinal canal are affected. The child is free from symptoms only when the food is well below the energy line. The paradoxical reaction upon increase in food consists in abnormal stools and abnormal fluctuation of the weight and temperature.

The alimentary nature of the gastrointestinal symptoms is evident from the fact that they show a very close relation to the quantity and quality of the food. Reduction in the amount of food reduces the severity of the gastrointestinal symptoms or causes them to subside altogether. The tolerance is reduced for both fat and sugar. The sugars undergo abnormal fermentations somewhat more easily than the fat, and the different sugars act differently, the tolerance for milk and cane sugar being lower than that for maltose or the dextrinized mixtures. Casein here, as in other nutritional disturbances, seems to exert no harmful influence upon the condition. According to the particular foodstuff, whose exhibition in a particular case in excess of the tolerance produced the outbreak of dyspepsia, we may distinguish a fat and a sugar dyspepsia. The sugar dyspepsia shows a greater tendency to elevation in temperature than does the fat dyspepsia. There are different grades of dyspepsia depending on the amount of tolerance.

Dyspepsia is the introductory stage to the severe disturbance of intermediary metabolism. During dyspepsia, along with the diminution in the power which enables the intestine to regulate its flora, there is also a sinking in that power which enables the intestinal wall to so affect the foodstuff that it is harmless during further metabolism. This weakening of the functional efficacy of the intestinal wall is necessary before the severe forms of intestinal disturbance can occur and without at least a transitory dyspepsia there can be neither decomposition nor intoxication.

Decomposition.—In decomposition the vacillating weight curve of dyspepsia begins a steady downward course. The whole appearance and behavior of the child changes. He becomes irritable and may cry for hours, oblivious to all stimuli except to those of hunger and thirst. He grasps eagerly at the milk flask and between feedings puts fingers or even the whole hand in his mouth. The emaciation which is not always marked at first gradually proceeds often until the child is a mere skeleton. The face looks aged and is heavily lined, and the mucous membranes are bright red, in strong contrast to the pale, slightly livid skin.

The stools show various characteristics—usually dyspeptic at first, they may become nearly normal, or dyspeptic stools may alternate with soapy stools. Fat diarrhea is also common toward the end and tarry stools have been noted from intestinal hemorrhage. The urine rarely shows changes until late, but the pulse is early affected. It is small and markedly slow; often 80 to the minute. Respiration is usually lengthened at first, later irregularities in the size and the frequency of the respiratory movements and Cheyne-Stokes breathing is seen. The tendency to subnormal temperature appears at once and is very characteristic.

It will be seen that clinically decomposition is almost the direct opposite of intoxication. In the former, clear mind, irritability, subnormal temperature, slow pulse, slowed and irregular breathing, undisturbed kidneys are characteristic; in the latter, disturbed consciousness, fast pulse, fever, rapid breathing, albuminuria and glycosuria. This difference is not a lasting one, however, because of the tendency later in decomposition to mixed forms with an admixture of toxic symptoms.

Two other phenomena which occur late in decomposition are hydrops and less often cyanosis. These symptoms are of serious, but not necessarily fatal, import. The prognosis in decomposition should always be guarded. Improvement is common even in the severe cases, but there is a great tendency to collapse. Death in these cases is sometimes remarkably sudden. It usually occurs in one of the following ways: (1) by sudden, unexpected syncope; (2) by apparent paralysis of the respiratory center. Periods of apnea usually precede the latter. There is no disturbance of consciousness. The face looks grey and the eyes are staring. The breathing becomes irregular and slow, the heart weakens, the temperature sinks far below normal, cyanosis increases or breathing gradually stops. Sometimes the heart stops first. Such a death may extend over days.

The Alimentary Nature of the Symptoms of Decomposition.—The rapid loss of weight in decomposition reminds one very much of starvation, but unlike starvation, which is caused by the withdrawal of food, decomposition is made worse by the giving of food; the more the amount of food is increased the faster the weight falls. This is surely as paradoxical a reaction as could be imagined. A marked reduction of the diet is the only way in which an improvement of the condition may be brought about.

When the different foodstuffs are examined we find that in decomposition the fat and sugar are responsible for the paradoxical reaction. In the less severe cases skim milk when given in the place of unaltered milk produces a stationary weight. Reduction of sugar also causes improvement, but there is a difference between the effect of fat and sugar. The intolerance toward fat is marked long before a diminished carbohydrate tolerance is demonstrable. While in balance disturbance the exhibition of fat in excess of the tolerance causes at most only a stationary weight, in decomposition it causes a rapid loss of weight, a loss more rapid in many cases than is seen in inanition and followed often by collapse and death within a short time. Even the amount of fat present in strongly diluted milk may be sufficient in severe cases to produce disastrous results. Not only the loss in weight, but also the disturbance of the circulation and respiration are directly influenced by the amount of fat given. The change in the pulse and respiration may appear as soon as one-half hour after the feeding of fat. The effect is like that of a specific respiratory or circulatory poison. The subnormal temperature is also unfavorably influenced by the increase, favorably influenced by the decrease of fat in the food. The causative action of the fat is therefore unquestionable. The sugar tolerance is sometimes still good when the fat tolerance is markedly reduced, but as a rule the carbohydrate tolerance suffers less than the fat. In many cases after a stationary weight has been obtained by the use of skim milk the addition of a small amount of sugar will again bring about a rapid loss of weight. It seems that sugar in small amounts causes the phenomena of decomposition, while in large amounts it produces those of intoxication. Casein seems to have no detrimental effect even when given in large amounts.

The most characteristic thing about decomposition is the marked progressive nature of the loss of tolerance; this affects first the fat, then the sugar, then practically all artificial foods, and, finally, mother's milk, the child becoming at last absolutely unnourishable.

Furthermore, this loss in tolerance, once begun, proceeds spontaneously without ceasing, even while the metabolic processes are largely spared by a marked reduction of the food. In a given case it will be found that a certain reduction of the food stops the loss in weight, but after a time, without change in the diet, the process begins again and a further reduction is necessary, and so on until finally further reduction is without effect and the case proceeds to death. The reason that the reduction of food produces a stop in the loss of weight is that when the amount of food is below the limit of tolerance there is no food left over to be metabolized abnormally. According to the amount of tolerance, cases of decomposition have been divided into three grades:—

GRADE I. Reduction in the amount of food produces a stationary weight in from three to six days. The pathological stools disappear, and a gradual increase in diet produces complete cure.

GRADE II. A plateau in the weight curve is obtained after a longer time. There is previously a greater loss of weight. It is hard to get rid of the pathological stools. An increase in the amount of food produces a relapse when, or just after, the energy line is reached. Such cases are rarely cured by artificial feeding.

GRADE III. No change in the weight curve or stools is obtained by reduction of the food. Death occurs in a short time if the child is not put on breast milk. Even when this is done extreme care must be used. This gradual reduction of tolerance explains many of the clinical facts of decomposition.

The increasing drop of the weight curve is due to the fact that the tolerance decreases more rapidly the further the disease progresses. The appearance of toxic symptoms late in decomposition is due to the fact that the sugar tolerance is so markedly decreased that the small amount of sugar in the milk cannot be metabolized properly. It also explains the increasing severity of the paradoxical reactions, for when the tolerance is very low the nutritional functions are severely overtaxed, even when food is below the energy line and there is no reserve power, so that a small amount in excess of the tolerance is able to completely overwhelm the already overworked metabolic processes.

The Relation of Decomposition to Starvation.—We treat decomposition by starvation. Is this not adding one evil to another? Here we must distinguish between the short starvation of a day or two and continued underfeeding.

The starvation day, which is so useful in dyspepsia, is also of service in the treatment of decomposition. When local intestinal symptoms are present a starvation day followed by underfeeding for a few days may result very favorably or even in a cure in the milder cases. In the severe cases it is totally unsuccessful. Moreover, the withdrawal of food in these cases entails a danger not present in the less severe nutritional disturbances, for collapse and death often occur, or at least a more rapid decrease in weight, simply from starvation.

How about continued underfeeding, which is necessary in the second and third grades of decomposition? Does the sparing of the metabolism allow this function to so strengthen itself that the amount of food may gradually be brought above the energy line, or does the condition become worse? Here we find a great difference between artificial and natural food. Continued underfeeding with artificial foods, while it may improve the condition transitorily, ends, in nearly all cases, in the second and third grade decomposition simply by adding starvation to the original disease. Every child in which a stationary weight has been maintained for a few days by underfeeding that does not react favorably to an increase in the food should be put on breast milk at once, whether the general condition seems serious or not.

The Reaction of Decomposition to Breast Milk.—When a child suffering from decomposition is placed upon breast milk the result is one of the most striking in therapeutics. However, this must be done with care in cases of the second and third grade. When a child with markedly diminished tolerance is given all it wishes of a breast milk rich in fat and sugar, death may result, and in many cases the loss of weight and the general condition may persist a long time before improvement begins. However, in most cases, except the very severest, which progress steadily to death in spite of anything that can be done, breast milk if properly administered, in reduced amounts, or fat-free milk if necessary, will in time completely cure decomposition. The efficacy of breast milk seems to be in the power of the fat- and sugar-free portion to so strengthen the impoverished metabolic processes that larger amounts of food can again be utilized by the organism. The fat and sugar of breast milk act nearly the same as those of cow's milk; it is the other constituents of the breast milk that possess the reparative power. If this be kept in mind the care that must be exercised and the method to be employed in the treatment of any case of decomposition will always be clear.

The essential character of decomposition consists then in a *progressive loss of tolerance because of which smaller and smaller amounts of food are properly metabolized and the paradoxical reaction is constantly more severe.*

Since normal tolerance and functional energy depend upon the normal material condition of the cells, we must assume that a decrease in these is due to a changed condition of the organs and tissues concerned in metabolism and as a result of this a changed condition of the whole organism. The change is not a simple one as in starvation, for starvation does not affect the functional activity of the remaining tissues as decomposition does. The constantly increasing failure of the power of assimilation as seen in decomposition depends on this: *i.e.*, that with the loss of weight there are very important substances lost or inactivated, the full possession of which is necessary for ordinary metabolic processes and the absence of which produces sensitive functional changes and finally death. Decomposition is alimentary in nature; it arises and continues as a result of dietary influences and is arrested and cured by the same means. The disturbance of the material condition of the tissue must therefore also be alimentary in nature, and the clinical transformation of the nutritional process must rest upon the fact that the food after gradually overcoming the primary resistance of the child destroys what was stored up during healthy days, instead of restoring the substances lost or inactivated, and so initiates a process which ends in decomposition.

Relation of Decomposition to Intoxication.—Some cases are pure decomposition or its prodromes. On the other hand, many cases show an admixture of intoxication. Nearly all cases of decomposition show some toxic symptoms during their course. The first toxic symptom is usually fever. This sign is absolutely foreign to decomposition and indicates intoxication. It follows the same laws as the fever of pure intoxication and is a result of exceeding the sugar tolerance.

Transition forms also occur in which not only fever, but disturbances of consciousness, albuminuria and air-hunger are present. Later in decomposition we find mixed forms in which one set of symptoms and then the other is more prominent, depending on whether the fat or the sugar gains the upper hand. The less severe mixed forms are like decomposition, except that the temperature is higher and there is a more rapid loss of weight. In mixed forms with severe decomposition and moderate intoxication, the picture is very confusing and variable, the symptoms of decomposition and intoxication alternating or sometimes partly neutralizing one another. The intoxication symptoms are usually more prominent immediately after feedings.

The Significance of Decomposition in Intoxication.—When speaking of alimentary intoxication it was stated that intoxication could not occur unless the nutritional process had first been damaged. This damage is produced in the large majority of cases by decomposition and its prodromal stages.

Decomposition produces a progressive loss of tolerance toward foodstuffs, especially fat and sugar, as a result of which the giving of these substances produces paradoxical reactions. Intoxication in all its grades, from alimentary fever to typical toxemia, is nothing but the parodixical reaction of a child suffering from decomposition to an amount of that foodstuff which possesses the ability to produce toxic symptoms inherently in excess of its tolerance for that particular substance. This reaction is possible as soon as the child, under the influence of the decomposition process, has reached the stage of dyspepsia, and the farther the child has proceeded the less the amount of sugar necessary to produce intoxication. Intoxication is never observed until there have been local disturbances in the intestinal canal, but as soon as these have occurred the danger of intoxication approaches. There is a certain parallelism between the abnormal intestinal processes and the alimentary fever, and measures which combat the first also improve the second. The insufficiency of the protective and regulative power of the intestinal wall is just as important for intoxication as for the outbreak of decomposition and whether toxic symptoms arise or not depends on the amount of sugar given.

There are two points to consider—the observation of children with nutritional disturbances teaches that with one and the same patient sugar may act in several different ways; it may cause simple fermentative processes, or fermentation with rapid loss of weight as in decomposition, or it may cause fermentation with typical toxemia, that is, intoxication. These differences are dependent upon differences in the dosages of sugar and one effect may be made to follow the other if the amount of sugar is increased.

The second set of observations is not less striking. The comparison of different patients or of different periods in the same patient's history shows that the same amount of sugar, which at one time produces dyspepsia with rapid loss of weight, at another time produces typical toxemia. This is explained by the changing condition of the patient and the changing tolerance which is characteristic of decomposition.

Here again the rule holds true that the paradoxical reaction is the more sensitive and the more severe the farther the child has progressed in the decomposition process and the nearer the child is to the base of the tolerance curve at the time that the sugar is given.

Fat sometimes appears to produce toxic symptoms. Why is this? This is only apparent; the explanation lies in the fact that the fat, by increasing the decomposition process, still further reduces the tolerance for sugar. The metabolism of the increased amount of fat so taxes the organism that the functional energy remaining is not sufficient to render harmless the same amount of sugar that it did before the fat was given, hence the toxic symptoms. Fat therefore only causes toxic symptoms indirectly by lowering the tolerance for sugar. This is not only true of individual cases, but is true in general.

To sum up: As a result of unsuitable food a nutritional disturbance develops, which consists in a material injury to the bodily condition as a whole, but especially to those tissues concerned in nutrition. This injury gives rise to a weakening of the nutritional function, the principal symptom of which is a reduction of the tolerance for food. Upon this as a basis the physiological reaction to food changes to an abnormal paradoxical reaction. The further the disturbance has progressed from the normal the smaller the amount necessary to continue the reaction.

In the beginning of this process the child loses only the ability to make use of the food in the perfect way in which the normal child does for the repair and growth of its tissues, while he is still able to protect himself from losses and catastrophes. There follows simply a lessened end result of the nutritional process. This is balance disturbance. This condition persists until again under the influence of unsuitable food, the signs of a severe local disturbance in the intestinal tube arise. This is dyspepsia. If favorable influences do not stop the progress of the illness, and bring about convalescence, general disturbances aside from the local ones appear and an important change occurs in the character of the illness which presents a reversal of the nutritional process in the true sense. Instead of the organism receiving energy and material for repair and growth from the food, the food destroys the body. The destruction proceeds more rapidly the more one tries to check it by the giving of food, and severe emaciation occurs.

The most important component of the food that may act in this way is first the fat and second the carbohydrates. The nitrogenous part of the food seems to have little influence on the condition.

What the body loses during its downward course is not alone the relatively unimportant, easily replacable substance like fat and water, but it seems likely that the food also robs it of important biological materials, which are essential for the normal activity of the nutritional process and which cannot be very much diminished without risk to life. For only in this way is it possible to explain that hand in hand with the emaciation there is a constant decrease in the assimilative power which makes the feeding of the child a greater and greater task until it becomes absolutely unnourishable. This material and functional exhaustion is alimentary decomposition.

The most characteristic and important sign of decomposition is the progressive diminution of the tolerance for food. This gradually extends to all kinds of food and food constituents, but to fat and sugar especially and while fat acts only toward the production of decomposition, even when the tolerance for it is widely exceeded, the action of the sugar is manifold. It not only helps in the production of decomposition, but when the tolerance for it is widely exceeded it is also capable of producing fever and toxemia. The toxemia and fever which appear to follow fat are really due to sugar and arise because the fat causes an acute lowering of the sugar tolerance. Alimentary intoxication is really only the paradoxical reaction of a case of decomposition toward an amount of sugar in excess of its tolerance. Dyspepsia, which stands on the threshold of decomposition by injury to the intestinal wall, makes it possible for sugar to act pathologically beyond it; decomposition itself by its progressive reduction of tolerance for fat and sugar increases the sensitiveness of the organism still further and increases the liability and the danger from toxic accidents.

ALIMENTARY ANAPHYLAXIS.—Richet, in his report (Seventeenth International Congress: Section IV., Bacteriology and Immunity) regards the introduction of the antigen, whatever it may be, alimentary or not, into the digestive tract, as characteristic of alimentary anaphylaxis. There the antigen is submitted to the action of the gastric juices and absorbed through the gastrointestinal mucous membrane. Rectal injections cannot give rise to this form of anaphylaxis, because the antigens are not there modified by digestive juices. Here one only witnesses the phenomena of absorption. Many kinds of albumins have been found to give rise to similar phenomena. Eggs, for instance, in some persons, especially children, determine urticaria, colic, diarrhea and vomiting, occasionally dyspnea and convulsions. Some persons are apparently more susceptible to the white of the egg, others to the yolk. Cooking diminishes, but does not always remove, the toxicity of the egg. Milk is another common foodstuff where the same phenomena have been witnessed. This, Richet thinks, may be the explanation of why some infants cannot support the milk of certain animals or wet nurses, whilst to the milk of others they are tolerant. The milk of these same wet nurses may be found quite suitable for other infants. Alimentary anaphylaxis is probably due to some defect of immunity and can be overcome by taking minimal quantities of the toxic foodstuff every day in increasing quantities until complete immunity is obtained.—*Universal Medical Record.*

SPLENIC ENLARGEMENT IN INFANCY AND CHILDHOOD.

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Few subjects have given rise to a more extensive or more confusing literature than that of splenic enlargement in infants and children, and it is not the purpose of this paper either to make a critical survey of this literature or to add to its complexity by another original contribution. On the contrary, it is intended only to present in a systematic way the clinical possibilities suggested by an enlarged spleen and to briefly review the more important literature in regard to the chief disease conditions having splenomegaly as an important manifestation.

Throughout infancy and childhood the lymphadenoid tissues are exceedingly prone to participate in the most varied disturbances of bodily function. Perhaps no other system is involved in so wide a range of disorders; and the intensity of the reaction in the organs and tissues built upon the lymphadenoid plan is often out of all apparent proportion to the exciting cause. This reaction is usually brought to notice by hyperplastic changes and one need but palpate the cervical, axillary and inguinal lymphatic nodes of the patients in any children's ward in order to realize how prone they are to enlargement.

The spleen is similarly involved in a wide range of pathological conditions and here, also, from the clinical standpoint, the manifestations of disease are practically always those of hyperplasia; that is to say, the findings are those of an abnormally palpable or abnormally percussible spleen.

Holt[1] gives the following figures for the size of the normal spleen:—

Birth	7.7 gms.
3 months	15.5 "
12 "	23.2 "
2 years	38.5 "
3 "	46.4 "

Kaufmann[2] believes 9 gms. to be the average weight at birth. The following principles, as laid down by Holt,[1] define what may be considered clinically a pathological increase in size: "In infancy it is practically impossible to outline the spleen by percussion, unless it is enlarged. . . . During full inspiration the spleen is often depressed enough to be felt at the free border of the ribs, but at other times it cannot be felt unless it is enlarged or pushed downward by some pathological condition in the chest. . . . When moderately enlarged, the lower border of the spleen is an inch or so below the free border of the ribs; when greatly enlarged, it forms a tumor which may nearly fill the left half of the abdomen."

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* From the Department of Pediatrics, University of Michigan. Read before the Senior Class, May, 1913.

The recognition of such an enlarged spleen and its differentiation from other tumor masses of the left hypochondrium will be facilitated by the following points (Holt,[1] Cabot[3]):—

(1) The enlarged spleen usually shows some degree of lateral movability.

(2) The surface is smooth and seems to be very superficial, that is, just beneath the abdominal wall.

(3) There is a sharp edge, which is broken by one or more characteristic notches.

(4) The spleen, as it enlarges, extends obliquely downward and to the right and maintains throughout the general shape of a normal spleen.

Many attempts have been made to formulate a working classification of the types of splenomegaly. As an example of a very simple grouping the classification proposed by Fowler[4] may be cited. He considered splenic tumors under three heads:—

(1) Inflammatory hyperplasia.
(2) Cysts.
(3) True tumors.

Since it is quite conceivable that cystic change may be the result of either an inflammatory process or a neoplastic growth, a more complete classification is desirable, for our present purpose, at least. I wish to propose the following scheme, which is reconstructed from those given by Holt,[1] Kaufmann[2] and others, as one which should be of use in systematizing our thought of the clinical possibilities when a case of splenic enlargement in a young patient is encountered.

SPLENIC ENLARGEMENT IN INFANCY AND CHILDHOOD.

(1) Circulatory disturbances. (*a*) Central. (*b*) Portal.

(2) Acute infections. (*a*) Malaria. (*b*) Typhoid.

(3) Chronic infections, intoxications, etc. (*a*) Syphilis. (*b*) Tuberculosis. (*c*) Malaria. (*d*) Rickets. (*e*) Cirrhosis of liver. (*f*) Kala Azar and other tropical diseases.

(4) Blood disturbances. (*a*) Leukemia. (*b*) Aleukemic leukemia. (*c*) Anemia pseudo-leukemia infantum (von Jaksch); anemia splenica infantum. (*d*) Simple anemia.

(5) Idiopathic splenomegaly (Gaucher and Bovaird).

(6) Parasitic cystic change.

(7) Congenital cystic disease.

(8) Neoplasms.

This classification still leaves much to be desired. The subdivisions are not altogether mutually exclusive, and the proper position of some of the items is still a subject of controversy.

(1) *Circulatory Disturbances.*—Splenic enlargement arises from the same *circulatory disturbances* in children that it does in adults. The most important thing is a chronic passive congestion. This may arise centrally from valvular disease of the heart, congenital cardiac anomalies, interstitial pneumonia or emphysema. It may also be due to some obstruction of the splenic vein itself or of the portal circulation from thrombosis, pressure of pancreatic tumors and the entire group of diffuse and localized increases in the connective tissue of the liver. In addition to positive evidence of the cause, such findings as cyanosis, edema, ascites and relatively slight blood changes will aid in differentiating this congestive group of splenic enlargements.

(2) *Acute Infections.*—Among the *acute infections* some degree of splenic enlargement is the rule rather than the exception. Here the increase in size is dependent upon two factors—active congestion and acute splenitis. The splenic tumor of acute malaria may be taken as the type for this group because of the marked susceptibility of infants and young children to malaria (Thayer[5]). In fact, the fairly common occurrence, in malarial districts, of a congenital paludism, as maintained by Peters,[6] is finding many supporters.

The acute malarial spleen is found to be much increased in size, very soft, and of a very deep, almost black, color. This color is due to the congestion in part, but largely to malarial pigment which finds deposit in the spleen in great amount. So much reduced does the consistency of the organ become that it may rupture from the slightest traumatism. Under the microscope the splenic pulp is found to be crowded with red blood cells containing malarial parasites and phagocytic cells of various types are also numerous (Thayer[5]).

Splenic enlargement also occurs in typhoid, acute miliary tuberculosis, plague, intermittent fever and diphtheria, as well as inconstantly in the acute exanthemata.

(3) *Chronic Infections and Intoxications.*—Among the *chronic infections, intoxications* and *disturbances of metabolism* there are a number in which splenic enlargement is common. *Congenital syphilis* is one of the most important of these. Here the enlargement of the spleen is dependent upon the diffuse fibroid change which may or may not be associated with the formation of gummata. Weber[7] says that moderate splenomegaly between the ages of five and sixteen years may be almost the only evidence of inherited lues. He also finds that the syphilitic type is often accompanied by occasional attacks of obstructive jaundice, and he calls attention to the fact that there is very little real anemia even when the cachectic appearance of the patient is marked. In fact, some cases show an actual polycythemia, so that he suggests for such cases the terminology of "splenomegalic polycythemia of inherited syphilis." This absence of severe anemia has an important bearing upon a controversy to which I shall later refer.

The fact that in *chronic tuberculosis* splenic enlargement depends upon the development of tuberculous nodules in the spleen need but be mentioned. If the process is sufficiently prolonged amyloid disease will increase the size and consistency of the splenic tumor.

Kaufmann[2] takes the chronic malarial spleen as the type form of this group. The hyperplasia of the follicles and pulp which characterizes the acute malarial spleen is gradually replaced by an increase in the stroma so that the organ becomes progressively harder and at the same time takes on a grayish-brown or slaty color. This "ague-cake" may reach a size of 1 kilogram.

The splenic enlargement in rickets is a rather constant feature, but is usually only moderate in degree and is assigned but little importance in treatises on the pathology of rachitis.

In hepatic cirrhosis, as Stengel[8] points out, it is necessary to distinguish between the cases in which splenomegaly follows the connective tissue increase in the liver, perhaps in part as a result of portal obstruction, and those cases in which the splenomegaly is the earlier feature, and some common cause must be sought for the changes in the two organs. Very little is known in regard to this point.

In concluding this group, reference must be made to *Kala Azar,* in which splenic enlargement is so constant a feature that it is well known by the name of "tropical splenomegaly." It may attack young children and infants and with them, as with older patients, the splenic tumor is one of the most important findings. At times the enlargement is enormous, so that the spleen fills the abdominal cavity (Leishman[8]). Pain and tenderness to palpation are often present. At autopsy the spleen is found to be of firm consistency, deep red in color, the capsule thickened, and throughout the hyperplastic pulp are present numerous mononuclear cells of various sizes containing the Leishman-Donovan bodies in great numbers.

(4) *Blood Conditions.*—The splenomegaly associated with blood changes forms the most interesting of the groups which I have made, and the one which offers the most inviting field for research in medical literature. Here we will consider four subdivisions—leukemia, aleukemic leukemia, anemia pseudoleukemia infantum of von Jaksch, and simple anemia.

M'Crae[9] has reviewed the literature in regard to the acute leukemia of childhood, and in 1900 could find but 13 fully verified cases in children. The chronic cases would add to this list, but in general it is not of very frequent occurrence. The acute cases usually belong to the lymphatic type; the more chronic are usually splenomyelogenous. In all, splenic enlargement is found and in the more chronic cases the tumor is of enormous size. On section the blood spaces in the splenic pulp are found to be packed with leukocytes and the more chronic the condition the more marked is the increase in connective tissue elements.

Still more rare are cases belonging to the group of aleukemias, sometimes called "pseudo-leukemias," in which the splenic enlargement and other changes resemble those of leukemia, but without any notable increase in the white count.

The *anemia pseudo-leukemia infantum* of von Jaksch might well form in itself the subject of an extensive paper. Because of its great importance and the fact that it is strictly a disease of infancy, it deserves a more complete discussion than is here possible. Carr[13] considers it by far the most frequent cause of splenic enlargement in young children.

Of the rather extensive literature which has grown up around this subject the best recent article is by Ostrowski.[10] According to Ostrowski the condition which was later called anemia pseudoleukemia infantum was first mentioned by Gretzel in 1867. Then von Jaksch in 1889 published his first paper upon it. The following year he reported additional cases,[12] and came to the conclusion that it was necessary to differentiate between cases with leukocytosis and a secondary anemia arising upon a rachitic basis, and others with a well-marked type of leukocytosis, as in the condition which he was reporting. The differentiation between leukemia and anemia pseudoleukemia infantum he based upon several points. In the latter eosinophilia is either absent or slight, while the red blood cell count and the hemoglobin content are forced much lower than in leukemia. The physical findings are also of assistance, for in anemia pseudoleukemia infantum it is usual to find a slightly enlarged liver and a greatly enlarged spleen, while in leukemia both organs are enlarged. He therefore concluded that .there is a disease entity in children which is to be characterized by oligocythemia, oligochromemia, well-marked and long-continued leukocytosis, splenic tumor, frequent moderate enlargement of the liver and a relatively favorable prognosis. The name of von Jaksch has since been coupled with the type form of this disease.

It was early noted that congenital lues and rickets were frequently found in the children with von Jaksch's disease. For instance, Carr[13] reports a series of 30 cases, of which 8 were certainly luetic and 27 gave evidence of rickets. Thus many came to feel that instead of having to deal with a disease entity the condition is to be considered as but a severe secondary anemia. Alt and Weiss,[14] Carr,[13] Fowler,[15] Melland,[17] and Drysdale and Thursfield[16] speak of it as a distinct disease. Riviere,[18] Ashby[19] and Ostrowski[10] emphasize the fact that even if the clinical picture is relatively distinct, splenic anemia in children is a secondary anemia and not an anemia *sui generis*. The English authors who do not consider infantile splenic anemia a separate disease lay great stress upon its association with rickets and congenital lues and seek in these diseases the primary cause. The following quotation from Ashby[19] will make this evident:—

"I will try to uphold the view that splenic anemia in children is simply a very severe secondary anemia, and not an anemia *sui generis;* that is, that splenic anemia in children is not a true primary anemia."

"The same toxin that causes rickets causes anemia, and if the toxin is severe enough, even splenic anemia."

In opposition to this view, Carr[13] assigns as his reasons for concluding that rickets, like syphilis, may predispose to splenic anemia, which may exist, however, without either of the former, the following:—

"(1) That in the very great majority of rickety children no enlargement of the spleen can at any time be made out."

"(2) That there is no connection at all between the severity of the rickets and the size of the spleen or the degree of the anemia."

"(3) In certain cases of splenic anemia there is no evidence whatever of rickets."

Splenic anemia of infancy usually appears in the latter portion of the second year. It seems to affect both sexes equally, though some writers speak of a slight preponderance of males. Its occurrence in twins has been several times noted. Hutchison[20] reports having seen five such instances. This is of the greater interest because there seems to be no special tendency for other children of the same family, but not twins, to have the disease.

The face of the child with splenic anemia has an earthy or waxy look and sometimes there seems to be a greenish tint, or the face may appear puffy. Rarely there are petechial hemorrhages. The spleen is usually much enlarged, often reaching the umbilicus, and its surface is smooth and relatively firm. The liver is but moderately enlarged, if at all, and the peripheral lymph nodes are not much increased.

At autopsy, the spleen is usually found to be between 200 and 500 grams in weight; its capsule thickened. Microscopically there is the usual increase of the stroma and a more or less complete disappearance of the follicles.

The blood picture is of special interest. The red cells usually run from 2,000,000 to 3,000,000; the color index from 0.6 to 0.8, though Cowie[21] has pointed out that in certain phases of the disease the color index may rise above unity. The red cells exhibit much anisocytosis and polychromasia, but poikilocytosis is not a marked feature. The nucleated reds are usually abundant and may reach as high as 2,770 per cm. (Fowler[15]). A moderate leukocytosis is the rule. This may reach as high as 40,000, but the average lies between 10,000 and 20,000. According to Fowler[15] the chief features of the white cell picture are the lymphocytosis, the general polymorphous character of the cells present and the almost constant occurrence of a small percentage of myelocytes. The polymorphous character depends upon the presence of cells which seem to be intermediate in form between the small lymphocyte and the polymorphonuclear leukocyte. Cowie[21] has called attention to the frequent occurrence of "an enormous mononuclear cell with a pale blue protoplasm, which is sometimes granular."

The following case recently seen in the service of the Department of Pediatrics of the University Hospital will illustrate many of the points mentioned:—

R. E., male, aged twenty-two months. Brought to hospital because of marked pallor, loss of weight, peevishness, and frequent crying spells. The child is one of twins; and there is one older child in the family. The labor was normal. The patient was apparently well at birth; weight, 7½ pounds, while his twin brother weighed 6 pounds. He was breast fed for two and one-half months and gradually weaned at five months. Baby was pale soon after birth and has steadily continued to grow more so. Walked when thirteen months old.

The twin brother died March 5, 1913. His symptoms were similar, terminating in "dropsy and lung trouble." When a year old, a physician said that he had anemia. The abdomen was large, but it is not known whether it contained fluid or not. The limbs are said to have been sensitive to touch during the last two months of his illness.

Physical examination of the patient upon entering the hospital showed as the chief findings a marked pallor, and very slight enlargement of the cervical and inguinal lymph nodes. Abdomen slightly below rib level and symmetrical. Liver can be felt two finger-breadths below the rib margin and the spleen can also be readily palpated. It extends two finger-breadths below the ribs, the edge is thin and no notch can be felt.

The blood examination shows: red blood cells, 3,730,000; hemoglobin, 30 per cent.; white cells, 11,350. The lymphocytes totalled 44 per cent., the polymorphonuclear cells, 49 per cent. The presence of large mononuclear forms with fine and coarse granules, pale blue or neutrophilic in color, was noted. Small lymphocytes with a "prickle-celled" appearance, free nuclear bodies and large degenerating lymphocytes were also numerous.

In general, the trend of the recent work has been in the direction of replacing the older name of "anemia pseudoleukemia infantum" by "anemia splenica infantum," and to consider that, while the condition is a secondary one in some degree, and has its cause most probably in some gastrointestinal disturbance, the clinical picture is definite. Rickets and congenital lues are to be considered as but contributory factors.

The prognosis is very grave, though not hopeless. The treatment is dietetic regulation, iron, arsenic and possibly Roentgen-rays.

In the very large group of *simple anemias* of infancy occasional cases exhibit moderate enlargement of the spleen. This group can but be mentioned here to call attention to the fact that many of these cases have hitherto found their way among those of anemia splenica infantum.

(5) *Idiopathic Splenomegaly.*—In 1900, Bovaird[22] described a new type of splenomegaly in two sisters—three and thirteen years of age. The older sister died after a splenectomy, and it was found that the splenic enlargement depended upon a very remarkable histologic picture. There were found nests and islands of peculiar cells, seemingly of endothelial origin, which had almost, if not quite, a neoplastic structure. This condition Bovaird believed to be identical with that described in a woman of thirty-two years by Gaucher[23] in 1882. In this patient, also, the splenic enlargement had appeared in childhood. Other cases have been reported by Picou and Ramond,[24] Collier[25] and others.

Bovaird[22] summarized his cases as follows: Enlargement of the spleen, beginning in childhood, slow and in type progressive. Enlargement of the liver secondary to that of the spleen may be considerable, but never reaches the extent of the splenic affection. Simple anemia with hemoglobin, 60 to 75 per cent. Softening of the gums with oozing of blood, repeated epistaxis, cutaneous hemorrhages. Icteric symptoms chiefly referable to the mechanical effect of the splenic enlargement.

The splenomegaly of Gaucher and Bovaird differs from the type of von Jaksch in the blood picture, for the former has neither a leukocytosis nor marked changes in the reds. From the types of splenic anemia found in adults the differentiation is not easy. The most important points are that the idiopathic type of Bovaird begins in childhood, is not fatal *per se,* at least at an early stage, and runs a very chronic and slowly progressing course.

Some authors consider the endothelial proliferation to be neoplastic. In this connection I may quote from Stengel,[26] who says, "The conclusion to which I have come is that the cases of splenomegaly of the type of Gaucher represent a primary neoplasm of the spleen somewhat comparable to the diffuse myelomata, and to certain infiltrating sarcomata of the liver."

(6) *Parasitic Cystic Change.*—Cystic enlargement of the spleen due to parasites is a rare condition. Only where echinococcus is common is this found. Thomas[27] found the spleen involved in 88 cases, being 2 per cent. of the total number of cases of hydatid disease which he studied.

(7) *Congenital Cystic Change.*—There is in the literature an account of a dermoid cyst of the spleen containing hair and sebaceous material. This is said to have been reported by Andral[28] in 1829, but Fowler[4] was unable to verify the reference and the original sources are not available to me. The possibility of cystic change from encapsulated hematomata, etc., must be borne in mind.

(8) *Neoplasms.*—Various neoplasms, both primary and secondary, may cause a splenic tumor, but these are very rare in children. The sarcomata are the most common, but lymphangiomata and hemangiomata have also been reported. Many of the reported cases show imperfect microscopical findings, and in others the descriptions fail to tally with recognized types of neoplastic change. Fowler[4] gives an extensive bibliography of primary splenic tumors, and the critical study of this mass of material would in itself constitute an interesting problem.

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SOME CASES OF DIARRHEA TREATED WITH CULTURE OF THE BACILLUS BULGARICUS.

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During the month of August, 1913, an opportunity was offered to make a chemical test of the action of the bulgaricus bacillus in cases of summer diarrhea, and while the 24 cases reported are too few to draw any positive conclusions from, one may get some idea as to the efficiency of the treatment.

The work was carried on at one of the milk stations of the New York City Health Department, and a commercial preparation of tablets made from culture of the bacillus bulgaricus with milk sugar was used in the tests. Tablets were kept in ice-box at an average temperature of 50°F., and were given out for use in small vials, each containing ten tablets. Average dose used was one tablet four times a day, crushed to powder and mixed with sterile water or some of the food in a teaspoon. Age of child was not considered in dosage, but the severity of the disease; largest dose given was one tablet at three-hour intervals.

The cases were all of the type known as acute intestinal indigestion, and included the following:—

Diarrhea from improper food, defective hygiene, overfeeding, heat, drugs, depression, fatigue, dentition and nervous influences, is characterized by the following symptoms: Locally, colicky pain, tympanites and diarrhea. Constitutional symptoms, slight or no fever, various mild nervous disturbances, may be slight vomiting at first, stools watery, yellow, yellowish and finally grass green; reaction acid, may be mucus and undigested particles of food. Quantity, 8-12 in twenty-four hours. Buttocks more or less excoriated.

Owing to the energetic work of the nurses attached to the station, the cases were all seen early, before the disease had advanced to the more severe types of diarrhea. After treatment was begun they were visited daily and a careful supervision of care, food, surroundings and medication instituted until cases were terminated.

Twenty-four cases were selected and divided into four groups as follows, Series I., or first group, being used as a control test:—

SERIES I. Ordinary routine treatment as follows: Initial dose of castor-oil, milk withdrawn for short period, child fed on cereal gruels and gradually returned to milk mixture by adding it to cereal in increasing quantities, first in the form of boiled skim milk.

The only other medication used was Pulv. Doveri in ¼ or ½ grain doses after each stool.

CASE 1. R. S., aged nineteen months. Ill three days; general condition fair; weight, 23 pounds. Symptoms, vomiting, fever, eight green and yellow watery stools in twenty-four hours. Present feeding, cereals, boiled milk, eggs, potatoes, toast. Has pertussis. Treatment, 1 dram castor-oil, barley gruel, ½ grain Pulv. Doveri after each stool. Well third day.

CASE 2. J. B., aged thirty-seven weeks. Ill three days; weight, 18 pounds, 13 ounces. General condition good. Symptoms, fever, four green, watery stools in twenty-four hours. Present feeding, breast at irregular intervals. Mucous râles in chest; child very fretful. Treatment, 1 dram castor oil, three-hour intervals between nursings, cold boiled water between, ¼ grain Pulv. Doveri every three hours. Second day, bowels normal, two yellow stools. Bronchitis. Temperature R., 101°. Liquid ammonium acetate mixture. Sixth day, child well; weight, 18 pounds, 13 ounces.

CASE 3. E. H., aged ten weeks. Ill one week; general condition fair; weight, 11 pounds, 2 ounces. Symptoms, six green, watery stools in twenty-four hours. Present feeding, breast and barley water irregular intervals. Treatment, 1 dram castor-oil, barley gruel twenty-four hours, ½ grain Pulv. Doveri after each stool. Second day, seven yellow and green stools, slight vomiting, 1 dram castor-oil. Breast and barley feeding, Pulv. Doveri ½ grain after each stool. Third day, four green stools, 1 dram castor-oil. Fourth day, one yellow stool. Weight, 10 pounds, 8 ounces.

CASE 4. F. F., aged eighteen months. Ill one week; general condition fair; weight, 19 pounds. Symptoms, slight vomiting, no fever, ten yellow, watery stools in twenty-four hours; sleeps very poorly. Present feeding, milk and barley half and half, 8 ounces at three-hour intervals. Treatment, 1 dram castor-oil, barley gruel, cold tea, Pulv. Doveri ½ grain after each stool. Second to fourth day, boiled skim milk gradually added to diet. Fifth day, five yellow stools. Seventh day, child well, two yellow stools. Weight, 18 pounds, 13 ounces.

CASE 5. S. S., aged one year. Ill two days; general condition fair; weight, 15 pounds, 12 ounces. Symptoms, five yellow, watery, undigested stools daily (white lumps, fat, mucus). Present feeding, ice-cream, milk, crackers, cake, etc. Treatment, 1 dram castor-oil, 32 ounces whole milk, 16 ounces sterile water, one tablespoonful cane sugar, 8 ounces every three hours with a pinch of citrate of soda. Second day, three stools, undigested. Third day, well, one yellow stool.

CASE 6. H. K., aged fifty-nine weeks. Ill two days; general condition fair; weight, 19 pounds. Symptoms, two large, green, watery stools this morning. Treatment, 1 dram castor-oil, barley gruel, toast, cold tea. Second day, one green, watery stool, 1 dram castor-oil. Third day, add boiled skim milk, bowels yellow. Fourth day, child well, one yellow stool.

Summary of Six Cases, Series I.—Average age, ten weeks to nineteen months. Average duration of illness before treatment, three days. Average duration of treatment, four days. All stationary, or lost weight.

SERIES II. In this series of cases no medicine of any kind was used, except an initial purgative and the administration of lactic bacillary tablets. The diet was changed by substituting cereal gruels, etc., for milk mixtures for a few days, and then gradually returning to proper feeding.

CASE 1. T. C., aged twenty-one weeks. Ill one month; general condition fair; weight, 9 pounds, 10 ounces. Symptoms, countless (mother's statement) yellow, limp, watery stools. Present feeding, anything, very careless, indifferent mother. Treatment, 1 dram castor-oil, very strong dextrinized wheat gruel made in station, 5 ounces every three hours; four lactic bacillary tablets in twenty-four hours. Second day, five yellow stools; add $\frac{1}{3}$ boiled skim milk, $\frac{2}{3}$ gruel, three tablespoonfuls milk sugar to quart. Third day, five watery, green stools. Fourth day, seven yellow stools. Fifth day, fifteen very small, yellow stools. Sixth day, gave ½ grain Pulv. Doveri after each stool. Seventh day, seven stools. Eighth day, one normal stool. Child well.

CASE 2. M. P., aged twenty-five weeks. Ill two days; general condition fair; weight, 12 pounds, 8 ounces. Symptoms, six yellow, watery stools in twenty-four hours. Present feeding, breast and patent food (Alpina). Treatment, 1 dram castor-oil, four bacillary tablets daily, breast at three-hour intervals. Second day, four yellow stools. Fourth day, child well, weight, 12 pounds, 8 ounces.

CASE 3. F. S., aged twenty-four weeks. Ill four days; general condition fair; weight, 11 pounds, 1 ounce. Symptoms, vomiting, no fever, six yellow, watery stools in twenty-four hours. Present feeding, breast and condensed milk mixture at irregular intervals. Treatment, 1 dram castor-oil, barley gruel and breast milk at three-hour intervals, four bacillary tablets daily. Second day, one yellow stool. Third day, child well.

CASE 4. T. N., aged fifty-four weeks. Ill two days; general condition fair; weight, 17 pounds, 10 ounces. Symptoms, no vomiting, temperature R., 100½°; three green, watery stools in twenty-four hours. Present feeding, general milk. Treatment, six $^1/_{10}$ grain calomel, four bacillary tablets.in twenty-four hours, barley gruel. Second day, bowels better, add boiled skim milk one-half and barley gruel one-half, 8 ounces every three hours, 1 dram castor-oil. Third day, stools normal, developed sibilant and sonorous râles in chest. R., temperature, 101°. Put under care of family physician for bronchitis.

CASE 5. E. R., aged fourteen months. Ill three days; general condition fair; weight, 16 pounds, 14 ounces. Symptoms, some vomiting, no fever, seven yellow watery stools in twenty-four hours, malnutrition. Present feeding, breast at irregular intervals, and cow's milk. Treatment, 1 dram castor-oil, boiled skim milk and barley water, 8 ounces every three hours; four bacillary tablets daily. Second day, one normal stool, tablets continued three days, one tablet three times a day.

CASE 6. C. P., aged fifty-six weeks. Ill one week; general condition good; weight, 19 pounds, 9 ounces. Symptoms, six yellow, watery stools in twenty-four hours. Present feeding, general diet. Treatment, 1 dram castor-oil, restricted diet, rice, toast, boiled skim milk, four bacillary tablets daily. Second day, well.

Summary of Five Cases, Series II.—Average age, twenty-one weeks to fourteen months. Average duration of illness before treatment, three days. Average duration of treatment, two days. Five cases stationary weight. One case unimproved.

SERIES III. In this series an initial dose of castor-oil was given, the bacillary tablets were used, and no change was made in the child's diet, the feeding and formula used at time of illness being continued.

Case 1. A. K., aged thirteen weeks. Ill two weeks; general condition good; weight, 10 pounds. Symptoms, six green, watery stools in twenty-four hours, no vomiting or fever. Present feeding, breast two and one-half to three hours. Treatment, 1 dram castor-oil, four bacillary tablets daily, breast two and one-half to three hours intervals. Second day, four green stools. Third day, two yellow-green stools. Fourth day, five green stools. Fifth day, unimproved.

Case 2. J. S., aged twelve weeks. Ill one day; general condition one of malnutrition; weight, 7 pounds, 1 ounce. Symptoms, slight vomiting, no fever, ten yellow-green, watery stools in twenty-four hours. Present feeding, modified milk and breast, two and a half hour intervals. Treatment, 1 dram castor-oil, four bacillary tablets daily. Second day, one stool, bloody mucus. Third day, three yellow stools, slight curding, seems well and bright. Fourth day, one white stool, no vomiting. Fifth day, one yellow stool; child well; weight, 7 pounds, 11 ounces.

Case 3. R. M., aged fifty weeks. Ill eight days; general condition good; weight, 18 pounds, 6 ounces. Symptoms, six yellow, watery stools daily. Present feeding, breast at irregular intervals; mother in ill health. Treatment, 1 dram castor-oil, four bacillary tablets daily. Fifth day, child well; weight, 19 pounds, 6 ounces.

Case 4. N. C., aged forty weeks. Ill three days; general condition good; weight, 16 pounds. Symptoms, seven green stools in twenty-four hours. Present feeding, modified milk mixture, 7 ounces at three-hour intervals. Treatment, 1 dram castor-oil, four bacillary tablets daily. Third day, one yellow stool; child well.

Case 5. A. B., aged fifteen months. Ill two days; general condition fair; weight, 16 pounds, 5 ounces. Symptoms, six yellow, watery stools in twenty-four hours; teething. Present feeding, modified milk three-hour intervals. Treatment, 1 dram castor-oil, four bacillary tablets daily. Second day, five yellow stools, no vomiting, 1 dram castor-oil. Third day, two yellow stools; child well.

Case 6. A. M., aged fourteen weeks. Ill two days; general condition fair; weight, 9 pounds, 3 ounces. Symptoms, four yellow, watery stools in twenty-four hours. Present feeding, modified milk two and a half hour intervals. Treatment, 1 dram castor-oil, four bacillary tablets daily. Second day, four green stools. Third day, four green stools, 1 dram castor-oil. Fourth day, nine green, undigested stools; treatment changed.

Summary of Six Cases, Sèries III.—Average age, twelve weeks to fifteen months. Average duration of illness before treatment, four days. Average duration of treatment, four days (4 cases). Two cases unimproved; changed to other treatment, fifth day. Two cases gained in weight.

Series IV. In these cases no medicine of any kind was used, nor was any change made in feeding; a sick child was simply given the bacillary tablets daily.

Case 1. A. S., aged twenty-seven weeks. Ill one day; general condition good; weight, 15 pounds, 14 ounces. Symptoms, four green, watery stools in twenty-four hours. (Pertussis.) Present feeding, breast and bottle, irregular intervals. Treatment, four bacillary tablets daily. Third day, one normal stool.

Case 2. F. F., aged twenty-nine weeks. Ill three days; general condition fair; weight, 14 pounds, 14 ounces. Symptoms, six yellow, watery stools in twenty-four hours. Present feeding, modified milk, 7 ounces, two and a half hour intervals. Treatment, four bacillary tablets daily. Second day, nine yellow, watery stools, well digested; one tablet every three hours. Third day, three yellow, watery stools, child bright and happy, five tablets daily. Fourth day, four stools. Fifth day, four stools. Tablets kept up to the eleventh day (five daily), when the child was having one normal stool daily; weight, 15 pounds.

Case 3. M. D., aged nine months. Ill one day; general condition good; weight, 11 pounds, 8 ounces. Symptoms, slight vomiting, no fever, three yellow, watery stools in twenty-four hours. Present feeding, modified milk, 6 ounces at three-hour intervals. Treatment, four bacillary tablets daily. Second day, one green stool. Fifth day, stools normal; weight, 11 pounds, 14 ounces.

Case 4. H. O'L., aged ten months. Ill ten days; general condition fair; weight, 15 pounds, 8 ounces. Symptoms, five large, green stools in twenty-four hours. Present feeding, boiled skim milk and barley gruel, 4 ounces every three hours; does not take food well. Treatment, four bacillary tablets daily. Second day, one green-yellow stool; takes 8 ounces food, feels well. Third day, one yellow stool, child well.

CASE 5. B. S., aged forty-four weeks. Ill twelve days; general condition good; weight, 14 pounds, 5 ounces. Symptoms, six yellow, watery stools in twenty-four hours. Present feeding, modified milk, three-hour intervals. Treatment, four bacillary tablets daily. Third day, stools normal, child well.

CASE 6. J. C., aged twenty-four weeks. Ill two weeks; general condition fair; weight, 8 pounds, 5 ounces. Symptoms, six green and yellow stools twenty-four hours. Slight cough. Present feeding, breast and bottle, irregular intervals; careless mother. Treatment, four bacillary tablets daily. Second day, three stools. Third day, three yellow, watery stools. Fifth day, one normal stool, child well; weight, 8 pounds, 9 ounces.

Summary of Six Cases, Series IV.—Average age, twenty-four weeks to ten months. Average duration of illness before treatment, six days. Average duration of treatment, four days. Three cases gained in weight.

CONCLUSIONS.

(1) Cases of summer diarrhea, especially those due to putrefactive fermentation, can be greatly helped by the use of the bulgaricus bacilli.

(2) The quickest results can be obtained by a proper balance of food and an initial dose of castor-oil, along with the administration of the bacilli.

(3) A certain number of cases can be brought to a normal condition by their use alone, without further treatment or change of diet. Sometimes with a gain in weight.

VACCINE THERAPY FOR PERTUSSIS.—L. Lagane (*Presse Méd.*, July 23, 1913) gives the results obtained by Nicolle and Concor in the treatment of 104 cases of pertussis by vaccine. Of these 37 per cent. were cured, and 36 per cent. improved, after from two to five injections had been given in from three to twelve days. Only those cases were cured that were inoculated within the first two weeks of the disease. These results are not as good as were hoped for, but are still encouraging. It should be noted that the injections have not been tried as a prophylactic measure as yet.—*American Journal of Obstetrics.*

A CHILDREN'S TUBERCULOSIS CLASS AT A SANATORIUM.*

BY MYER SOLIS-COHEN, A.B., M.D.,
of Philadelphia.

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The chief fault found with sanatorium treatment of tuberculosis is that for a limited period it provides conditions suitable for recovery; the patients on their discharge, as a rule, returning to the same unfavorable environment that was primarily responsible for the disease. It is claimed, on the other hand, that residence at a sanatorium teaches a patient how to live, so that on his return home he will be able to continue the hygienic measures he has learned there. While some patients undoubtedly absorb a great deal from the training they receive at a sanatorium, many, unfortunately, fail to profit by it. In the majority of cases I believe this is due to the absence of the proper kind of direct instruction. The fact that under the watchful eye of the nurse the patient observes all the rules of the institution in regard to air, food, rest, exercises, bathing, etc, is no assurance that he appreciates their importance or realizes the necessity of continuing these hygienic measures after leaving the sanatorium, or even knows how to carry them out in the face of difficulties. Moreover, should the restrictions and the routine at the sanatorium have proved irksome, he will be still less likely to continue them when no longer under sanatorium discipline. The terms "cured," "apparently cured," or even "disease arrested," applied to a patient on discharge make him regard himself as free from tuberculosis and hence no longer in need of the measures he employed when he had the disease. The treatment of tuberculosis—whether in office, home, dispensary, sanatorium or hospital—I regard as in great measure a failure if the patient is not made to understand the reason for everything he does in preventing the spread of infection and in returning to, and keeping in, health, and if he is not shown how to live hygienically, no matter how unfavorable his surroundings or how ignorant the people at home. In a dispensary or sanatorium this necessary instruction can best be given by means of a tuberculosis class of the kind I am about to describe. Over six years ago I started such a class in the dispensary of the University of Pennsylvania Hospital. Physical difficulties in the buildings and arrangements and linguistic difficulties among the patients prevented my establishing similar classes in the sanatoria with which I have been connected until some two and a half years ago, when I took charge of the children at the Philadelphia Jewish Sanatorium for Consumptives at Eagleville, Pa., where there is a children's pavilion, provided with an open-air schoolroom. Before examining the two dozen English-speaking children individually at my bi-weekly visit, I meet them in the schoolroom, where we hold class for half an hour or so. This class differs in several particulars from the other classes of which I have knowledge and resembles more the class I used to have in the University of Pennsylvania Hospital medical dispensary, described by me a little over four years ago.*

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* Read before the Philadelphia Pediatric Society, January 13, 1914.

In the tuberculosis classes of Dr. Pratt the chief features were daily records kept by the patients, social service, a fund for supplying needed articles, and weekly meetings at which the physician instructed the patients and endeavored to stimulate a spirit of emulation among them. This is the model upon which all other classes have been based. Some have abolished the talks to the assembled class. Few have added important features. Some classes have been discontinued or have lapsed, largely, I believe, on account of what I regard as the objectionable features of the class instruction as ordinarily given.

The endeavor to stimulate the patients to emulate each other by posting on a blackboard the greatest gains in weight, the greatest amount of food taken, etc., I regard as a mistake. While it may spur on some indifferent patient to eating more, it discourages those who through no fault of their own are losing weight and appetite, and it lays too much emphasis on milk and eggs and on the kind of improvement that can be measured in pounds. Individual improvement or decline, as a rule, is a subject for private conference between physician and patient. When, however, failure to improve can be traceable directly to some fault in hygiene, I sometimes mention the case as a text from which to draw a lesson, or else present the patient to the class for them to seek out the cause of the failure to improve.

Another factor that mitigates against the success of the class is the form of instruction given. A physician gets tired of saying the same things over and over again to the same patients, and in like measure the patients get tired of hearing over and over the same things. Interest therefore flags in both. Reiteration, instead of making the matter taught more firmly grounded and better understood, usually produces lack of attention and concentration, which renders the instructor's efforts a waste of time and energy. I endeavor to obviate this by making the patients occasionally give the talks, especially when there is a newcomer to be instructed, and by always quizzing them to find out what they know. This soon demonstrates that, despite frequent instruction, a patient's knowledge as to what he must do, and why, is not always accurate, clear, well ordered or immediately available. The patients who listen to one of their number are all attention to see if the speaker makes a mistake or omits anything. I ask them whether the information given by their fellow member is correct and whether they can add to it. Should the patient's talk be incomplete I enlarge upon and supplement it, and if involved or not clear, I explain and simplify it.

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* Myer Solis-Cohen: "Some New Features in the Class Method of Treating Tuberculosis," *Journal of the American Medical Association*, 1910, Vol. LIV., p. 1,193.

There are several differences between my class at the dispensary and the one at the sanatorium. In the latter, for instance, the records are kept by a nurse instead of by the patient. The dispensary patients were taught how to modify and adapt home conditions according to the possibilities of the house and the patient's means. Difficulties were discussed and methods devised for overcoming them. The patients were shown how to improvise when unable to afford necessary articles or measures. The patients in the sanatorium also, in addition to being told the reasons for the various precautions they must take and the hygienic measures they observe, are likewise instructed how they should live when they return home in order to remain well.

One thing common to both classes is the constant urging of the patients to preach to their families and friends the gospel of right living. Their training as lecturers is partly for this purpose of teaching hygiene to all with whom they come in contact. The children at the Eagleville sanatorium all speak English, but their parents are usually of foreign birth and often of foreign tongue. On their return home the discharged patients can instruct their parents how to live, just as talks to "little mothers" on the care of babies have reached not only the children to whom they were directly addressed, but have been carried home and there repeated to the real mothers, who in consequence also derived profit from them. Foreign-born parents often have a great respect for their children's knowledge and may thus be reached indirectly.

The talks given to the children deal with the nature of tuberculosis, the avenues of infection, the ways to avoid communicating the disease, and the hygienic measures necessary to regain and retain health. The questions asked are never leading, but are so phrased as to bring out what knowledge the child may possess. One of the little patients, for instance, is asked whether he is going to give the disease to his brothers and sisters when he returns home; and if he answers in the negative, is asked how he is going to prevent it. He is made to give the reasons for everything he does. Thus he may reply that he will hold a paper napkin in front of his mouth when he coughs, so that the germs will go on it and not enter the air of the room, thence to find their way down some other people's throats into their lungs. He may say he will always use a sputum cup, because should he spit upon the floor the germs will fly in the air and be breathed in by others. His eating utensils, he will explain, are to be kept separate, so that the germs that get on them from his mouth and lips will not be transferred to the mouths and lips of others. In telling how they are going to keep well after leaving the sanatorium the children often say that they will ask their mothers to keep their windows open so that they will have plenty of fresh air; that they will take their morning chest bath so that the blood will circulate better and they will not be so liable to take cold; that they will eat plentifully of proper food, exercise moderately, rest sufficiently, and go to bed when they feel feverish, have a cold, or spit blood, etc.

When a couple of children are reported as having been negligent in the use of paper napkins and sputum cups, I tell one to look after the other; to instruct him and see that he observes the proper precautions. Where, too, a child seems stupid and unable to grasp the meaning of the talks, or at any rate is unable to collect his wits when called upon in the class-room, I put him in charge of one of the better informed children, who teaches him during the intervals between my visits.

The results of this class teaching have been very encouraging. The children seem to understand and remember what they are told. It is remarkable how a child five years of age will get up in the class-room and explain intelligently what he has learned at previous sessions. In adult classes it would be well to discuss conditions at home and ways and means of modifying them in accordance with hygienic rules; but such a discussion I regard as inexpedient with children.

Sanatorium treatment is incomplete unless the patients are instructed and drilled in the life they should lead after their discharge. With class instruction the good results obtained at sanatoria would undoubtedly be more lasting and relapses would occur less frequently. The six or more months' residence would then be more than a temporary change of environment; it would be the beginning of a new mode of life not only for the patient, but for his family at home. The unfavorable environment that first rendered him susceptible to the disease will on his return be changed through intelligent modification to a more hygienic environment in which it will be possible for him to keep well.

SALVARSAN IN CONGENITAL SYPHILIS.—J. W. Simpson and L. Thatcher (*British Medical Journal,* August 30, 1913) conclude that salvarsan is a potent remedy, and with proper dosage and technique can be used with safety in the case of the youngest child. In very severe cases, however, such as those with pemphigus, extreme wasting, etc., the dose should be reduced from 0.01 gram to perhaps half that amount. In three of the authors' most severe cases death ensued within sixty hours, and they think that a smaller dose, repeated afterward if necessary, would have been safer. In comparison with mercury, salvarsan gives much better results, especially in the severer cases. After giving an injection it is wise to continue the mercurial treatment, as a combination of the two seems to be more efficacious. Some of the authors' cases, however, which did not attend again for three or four months, had done well with salvarsan alone. In all the older children mercury and iodid had been previously given, with very slow improvement (especially in eye cases). After salvarsan was given improvement was much more rapid, but it is always advisable to carry on the mercury and iodid treatment also after the injection. In doubtful cases of congenital syphilis it is better to take the blood from the mother for a Wassermann reaction than to submit a weakly infant to such a procedure.—*Medical Record.*

SOCIETY REPORT

THE PHILADELPHIA PEDIATRIC SOCIETY.

April 14, 1914.

William N. Bradley, M.D., President.

CONGENITAL ABSENCE OF BOTH HEPATIC DUCTS.

Dr. Oliver H. Stansfield, by invitation, showed a white girl of three months, admitted to the Polyclinic Hospital February 1st, with a history of jaundice since birth. Stools had always been white, "putty-like," large and frequent. Urine had always been unusually dark. She had had no other illness. Family history was also negative. Examination showed an extremely jaundiced, drowsy infant, with purpuric spots on both forearms. Sclera were deep yellow. Liver reached almost to the iliac crest on the right, and to the umbilicus on the left; it was firm, smooth and not pulsating. Spleen was also markedly enlarged. Temperature was subnormal and pulse slow. Urine examinations showed increased urobilin and biliary pigments, no sugar, albumin or casts. Stools contained occult blood, much fat but no hydrobilirubin. Levulose hepatic function tests showed great hepatic inefficiency. Autopsy showed biliary cirrhosis with absence of both hepatic ducts. The gall bladder was empty and unstained, never having contained bile. The pancreatic and retroduodenal portions of the common duct were present. Spleen showed moderate passive congestion.

Dr. J. P. Crozer Griffith said that the case was certainly a most interesting one and closely allied to congenital obliteration of the bile ducts, of which he had been fortunate in seeing two instances. There were many grades of obstruction and a close association with congenital biliary cirrhosis. The method of production was uncertain and there was a decided division of opinion among writers as to the cause, some believing that the obliteration was primary, occurring as a malformation, the result, perhaps, of some inflammatory process developing during intrauterine life. This might advance to such an extent that the lumen of the bile duct was not only obliterated, but that the entire duct had disappeared. This might be true in Dr. Stansfield's case. In such cases the cirrhosis of the liver, so often associated, is a secondary condition to the duct lesion, and would be more marked if the patient lived longer. One of Dr. Griffith's patients died at ten days. There was complete obliteration of a portion of the common duct and the cirrhosis of the liver was trifling. The other view is that cirrhosis of the liver is primary, with a descending inflammatory change which finally involves the bile duct. In Dr. Griffith's second case, in which the cirrhosis was very marked, the child died at five months. Dr. Griffith finally referred to the literature upon this subject.

UMBILICAL HERNIA.

Dr. Harry Lowenburg presented a new belt for the treatment of umbilical hernia in children

RETROPERITONEAL TUMOR.

Dr. F. B. Jacobs showed a girl, aged four years, with an abdominal tumor as large as a small cantaloupe in the left hypochondriac region, pushing forward against the abdominal wall. The tumor was firm, not tender or movable. Its duration is unknown. The child had vomited everything for some time. Since admission to the Howard Hospital she had only vomited twice. There is no blood in the stools; urine is negative. Leukocytes are 12,800, with 74 per cent. polymorphonuclear, 21 per cent. lymphocytes, 1 per cent. large mononuclears and 4 per cent. transitionals. The X-ray is wholly negative. The probable diagnosis made was retroperitoneal sarcoma.

THE SPLEEN IN RELATION TO BLOOD DESTRUCTION AND REGENERATION.

Dr. R. M. Pearce, by invitation, gave a lantern demonstrastration, with the following conclusions: Splenectomy in the dog is followed by anemia of the secondary type, reaching its height after four to six weeks with return to normal after three to five months. It is followed by increased resistance of the red blood cells; decreased tendency to jaundice when hemolytic agents are injected; a tendency, after six months, for the yellow marrow of the long bones to be transformed into red marrow.

CHRONIC SPLENOMEGALY WITH ANEMIA.

Dr. E. B. **Krumbhaar** read a classification and analysis of the different types of chronic splenomegaly with anemia. Splenic anemia was first established by Gretsel forty-eight years ago to denote anemia with enlargement of the spleen without leukocytosis. It should now be restricted to the early stages of Banti's disease or discarded entirely. We now differentiate this from Gaucher's disease, or large-celled splenomegaly; Banti's disease, or splenic anemia with hepatic cirrhosis; von Jaksch's pseudoleukemia infantum, probably secondary to rickets; and the two types of hemolytic jaundice with splenomegaly, Hayem-Widal or acquired type, and Chauffard-Minkowski or congenital or familial type. Dr. Krumbhaar analyzed these types, interpreting each in the light of Dr. Pearce's experimental evidence. He also described the hematological tests used in diagnosis, resistance of the red corpuscles, percentage of reticulated cells, autoagglutination test, etc. He also called attention to the cardinal features of acholuric jaundice, chlorotic anemia, chronic splenomegaly, increased urobilin in the blood and urine, etc. A differentiation of the two types of hemolytic jaundice, based on an analysis of 154 cases, showed that the anemia was much more severe in the acquired types, Widal's "crises of deglobulization" more frequent and the autoagglutination test positive. Less confusion would result if the term congenital was discarded. Cases identical with the acquired type may follow acute infections, but the signs of increased hemolysis usually disappear when the underlying cause is removed. In very severe cases the picture may resemble that of pernicious anemia. In treatment splenectomy has proved successful in both types of hemolytic jaundice, whereas in pernicious anemia only slight improvement has followed removal of the spleen.

SPLENECTOMY AS A THERAPEUTIC MEASURE.

Dr. G. P. **Müller** said that splenectomy had been practiced for many years for relief of a variety of affections, but with the exception of injury and tumor of the spleen many of the operations have been done on rather vague physiologic grounds, without sufficient foundation for their performance. Splenectomy is indicated in rupture of the spleen, displacement with torsion of the pedicle, certain cases of hypertrophy from malaria, in cysts and tumors. It is on trial in Banti's disease, splenomegaly with hemolytic jaundice and pernicious anemia, the indications not being clearly marked. In rupture of the spleen there is no necessity to remove the organ if the tear is small and the hemorrhage easily controlled. The history of a blow or fall affecting the splenic area, followed by rigidity of the abdominal muscles and signs of hemorrhage should be enough for an exploratory incision. It is not necessary to wait for dullness in the flanks. In typhoid fever many cases of rupture of the spleen have been reported and rough handling of the spleen in this disease is to be deprecated. When the normal spleen is excessively mobile the patient will be found to be visceroptotic; the hypertrophied spleen may also descend from its normal position, but adhesions in the hypertrophy of the ligament usually hold the organ in place. Removal of the spleen gives better results in these cases than fixation, but operation should not be countenanced unless definite symptoms have been produced. When tumor or cyst of the spleen have been diagnosed, splenectomy should be performed, although resection of a cyst has been successfully done. Splenomegaly occurs in many conditions. An enlarged spleen in malaria is not an indication for operation. Splenectomy is only permissible when grave symptoms are caused by undue tension on the pedicle or when torsion is threatened. In Gaucher's disease it is probable that lymph nodes and bone marrow are also involved; splenectomy is not indicated theoretically, though some cases have been reported in which improvement followed operation. In Banti's disease splenectomy has apparently proved curative if performed in the early stage, before cirrhosis of the liver has become marked. In certain cases of hemolytic jaundice associated with splenomegaly, either of congenital or acquired type, splenectomy is indicated mostly upon empirical grounds. In pernicious anemia splenectomy has recently been advocated by Eppinger. It is necessary to distinguish disease of the liver, of the portal vein and certain other affections from the so-called splenic anemia before submitting the patient to operation. Finally the evidence of the decreased resistance of the patient to infection after splenectomy is conflicting.

Dr. J. S. Rodman said that he had been impressed by the papers. He had been much interested in a special phase of the subject—Banti's disease. Dr. Willard and he had reviewed the literature and concluded that Banti's name should be attached to the third stage of splenic anemia. They tried to determine relationship between thrombosis of the portal and splenic veins and splenomegaly. On account of the frequency of thrombosis of the portal and splenic veins at autopsy in cases of splenic anemia, they attempted to produce in dogs obstruction of the splenic vein by ligature. Immediate enlargement of the spleen occurred, persisting about one month, gradually being replaced by atrophy. They also partially clamped the portal vein, again producing enlargement of the spleen, only temporary. During the splenic enlargement there was a leukocytosis which returned to normal three weeks after operation. They failed to produce splenic or portal thrombosis. They believe that thrombosis was more an accidental finding than of any great etiologic importance. They agree with Pearce in attributing the anemia to increased resistance, which in turn had been brought about by over-action of splenic cells. The operative mortality has been greatly reduced during the past decade. Up to 1900 Bessel-Hagan found 36 per cent. died; in 1908 Johnson had a mortality of 18 per cent., including splenectomies for all conditions. From 1908 to 1912 5 to 10 per cent. of cases in first and second stages died. In the third stage the mortality is much greater—about 56 per cent. A combination of splenectomy and Talma's operation has proved successful in the third stage.

Dr. Emery Marvel, of Atlantic City, N. J., referred to 4 cases. In one spontaneous rupture of the spleen occurred in typhoid fever with recovery.

Dr. W. W. Babcock referred to several cases illustrating splenic disease and injury. A boy of eight, who was entering the third stage of Banti's disease, showed markedly increased susceptibility to infection after splenectomy. He had suffered from increasing gastric disturbances for three years. The liver was atrophic and showed advanced cirrhotic change. After splenectomy the symptoms disappeared, but there was evident susceptibility to infection. Three years after splenectomy he caught what seemed to be a slight cold, which proved fatal. Dr. Babcock also referred to several other cases occurring in adults.

Dr. L. J. Hammond said that the laboratory is evidently not yet ready to classify cases of splenomegaly into those which are operable and those which are inoperable. He believes in performing splenectomy for traumatic conditions of the spleen only.

It is not indicated in leukemia, since the spleen is only one of the organs affected. Together with the lymph glands the spleen is affected secondary to the red bone marrow. Concerning the factors entering into operative mortality, it may be said, in addition to those referred to, that removal of the enlarged spleen carries with it the abstraction of as much as 4 pounds of blood from the system, which in itself may prove a serious element.

Dr. Krumbhaar added that if excessive hemolysis is noted in Dr. Marvel's last case, the underlying condition should be treated and the symptoms of excessive hemolysis might be removed in this way. The greatest conservatism should be used in removing a spleen, and the operation only attempted after most careful study has shown it to be the only available procedure.

Acute Urticaria Treated with Epinephrin.—A. W. Swann reports a series of cases of acute urticaria and serum rashes (*Journal of American Medical Science,* March, 1913) in which the subcutaneous injection of a 1/1,000 adrenalin solution was followed by the disappearance of the erythema and wheals. In each case a dose corresponding to eight minims for a patient of 140 pounds was given. Two doses administered at intervals of ten minutes always sufficed to produce the desired results. Improvement was usually evident after seven to ten minutes; itching ceased in from five to twenty minutes after the first injection. In 5 out of the 6 cases, however, the rash and wheals reappeared in from one hour to three days.

Swann suggests that epinephrin given hypodermically may be used to advantage in certain more serious, yet similar conditions, of which angioneurotic edema (of the epiglottis and larynx) is a type, and that when so used the drug may be the means of saving the patient's life. Another condition which may be influenced by epinephrin in a similar manner is the severe bronchial spasm and edema which occasionally occurs in cases of anaphylaxis. Swann observed such a case in which epinephrin was used, however, without much benefit. The possibility of differentiating rashes of purely vasomotor origin from those of other types by means of hypodermic injections of adrenalin also suggests itself. —*Universal Medical Record.*

CURRENT LITERATURE

ABSTRACTS IN THIS NUMBER BY

DR. CHARLES E. FARR.	DR. MARK S. REUBEN.
DR. JEROME S. LEOPOLD.	DR. S. W. THURBER.
DR. HAROLD R. MIXSELL.	DR. E. T. WYMAN.
DR. WILLARD S. PARKER.	DR. J. HERBERT YOUNG.

DISEASES OF EAR, NOSE AND THROAT.

INGERSOLL, J. M.: THE OPERATIVE FINDINGS AND RESULTS IN MASTOIDITIS, ACUTE AND CHRONIC. (*Annals of Otology, Rhinology and Laryngology*, September, 1913, p. 629.)

This paper reports 8 cases of mastoiditis and is written with the purpose of helping in the early recognizing of such cases and the proper operative procedures to prevent complications.

CASE 1. A boy, one year old. He had had a coryza followed by a purulent discharge from the right ear for five weeks. The temperature was normal, but there was sagging of the posterior and upper wall of the auditory canal. A mastoid operation was done and a large antrum filled with pus evacuated. The mastoid wound healed in two weeks, the discharge ceased in a few days. Hearing now normal. This case illustrates the fact that a profuse aural discharge continuing for more than four weeks indicates mastoid involvement. The swelling of the postero-superior portion of the auditory canal is indicative of the process involving the mastoid cells.

CASE 5. Girl of three years. Severe coryza for four days, associated with pain in the right ear. The drum membrane was red and bulging; incision revealed free serous discharge, which became purulent in two days. The temperature ranged from 101° to 103° F. Twelve days after the incision the postero-superior canal wall was seen to be swollen. The mastoid was opened and the temperature came down to normal in three days. For twelve days the case seemed to be progressing favorably, but then the temperature went up to 102°, and granulations appeared on the posterior wall of the canal. Upon a second operation, necrosis of the bone was found on the posterior canal wall and down as far as the mastoid tip. When this was removed recovery took place in four weeks. In this case infection involved the mastoid in spite of free and early incision of the drum membrane. The necrosis which developed after the first operation was probably due to the severity of the infection (streptococcus) and the poor resistance of the patient.

CASE 6. Boy of four years, with a chronic foul discharge from the left ear since infancy and the middle ear filled with granulations. A radical mastoid operation was done and sequestrum containing most of the mastoid cells and the outer covering of the lateral sinus was removed. The ear was dry and healed in two months. As the roof of the middle ear and antrum were necrotic, it was a wonder that the child had not died of meningitis or sinus infection.

CASE 7. A boy of five years, with a free, foul, purulent discharge from the left ear for fourteen months, following scarlet fever. Middle ear filled with granulations and the temperature was 105°F. He was semi-conscious, was restless and had nausea. A radical mastoid operation was done and the roof of the middle ear and antrum were found necrotic, the dura was inflamed and tense. This dura was incised and some serous fluid escaped. The boy died on the third day following. His life would probably have been saved if he had been seen and operated upon before the meningitis developed. S. W. THURBER.

SURGERY.

MORO, E.: PAIN IN THE REGION OF THE UMBILICUS IN OLDER CHILDREN (NAVEL-COLIC). *Münch. Med. Woch.*, December 23, 1913, p. 2,827.)

Moro calls attention to the fact that pain in the region of the umbilicus is a rather common occurrence in neurotic children. At times the pain is localized in the epigastrium or even at McBurney's point and is commonly diagnosed as appendicitis. One of Moro's cases was operated after the diagnosis of appendicitis had been made. Operation revealed a normal appendix.

This umbilical pain is often accompanied by constipation. There are present other symptoms of a neurotic taint, as periodic vomiting, nausea and vomiting before school, migraine, asthma, and enuresis. At times orthostatic albuminuria is observed. The reflexes are, as a rule, increased. The reviewer has seen many such cases with the above-described symptoms and with the corneal and pharyngeal reflexes absent or very much diminished, while the patellar reflex has been increased.

The treatment in this class of cases consists in suggestion. Application of the faradic current to the umbilicus followed by a small piece of adhesive plaster firmly applied generally does away with the pain. Recurrent attacks are frequently seen.

JEROME S. LEOPOLD.

WOLBARST, ABRAHAM L., M.D.: UNIVERSAL CIRCUMCISION AS A SANITARY MEASURE. (*Journal of American Medical Association*, January 10, 1914.)

Specifically the author's reasons for advocating universal circumcision are as follows:—

(1) It is a great aid to cleanliness of the genitals.

(2) It is a decided prophylactic against infection with syphilis and chancroids.

(3) It prevents in great measure the development of venereal warts, herpes, epitheliomata and other growths.

(4) It offers a diminished tendency to masturbation, nocturnal pollutions, convulsions and other nervous results of local irritation.

(5) It diminishes local complications in the presence of venereal diseases.

(6) It makes balanitis impossible.

(7) It prevents phimosis and paraphimosis with their attendant complications.

Holt was unable to find more than 40 cases of circumcision infected by tuberculosis or syphilis. When the millions of Jewish and non-Jewish children who have been circumcised are considered it is apparent that the percentage of infections is very low indeed. The modern technique will practically make this operation a negligible risk. HAROLD R. MIXSELL, M.D.

SMITH, OLIVER C.: HYGROMA CYSTICUM COLLI AND HYGROMA AXILLARE. (*Journal of American Medical Association*, February 14, 1914, p. 522.)

Smith presents the histories of a case of hygroma cysticum colli and 2 cases of hygroma cysticum axillare. The cervical case was in a boy of twelve years, in whom a lump had been noticed in the left side of the neck for ten years, with rapid growth for two years following an injury. At operation the cyst was found intimately adherent to the parotid. It was removed intact. Examination showed a large cyst with clear serous contents and a smooth lining made up of a single layer of endothelial cells. The walls were thin and tough, trabeculated, and contained dilated lymph spaces, small areas of lymphoid cells, fat and fibrous tissue, numerous capillary blood vessels and a little smooth muscle. The boy recovered and there is no recurrence.

The author's axillary case was in a boy of twenty who had noticed the growth in his right axilla for nine months. The cyst was of the multilocular type and was easily removed. The microscopical examination was like that of the neck case. The boy has made a complete recovery. Smith reports a second axillary case, which was operated upon by Dr. A. M. Rowley. A female infant of fourteen days had a large cystic tumor removed from the left axilla. It was multilocular and attached to the skin. The contents, lining, etc., were as in the other cases. The child recovered.

From the literature Smith is able to collect in all, including his own cases, 96 cases of hygroma cysticum colli, 37 of hygroma axillare, and 12 in various other regions. They are frequently congenital and are usually seen in children. The probable cause, according to Dowd, is embryonic sequestration.

CHARLES E. FARR.

GRAY, H. M. W., AND MITCHELL, ALEX.: A SERIES OF CASES OF APPENDICITIS IN CHILDREN. (*British Medical Journal*, February 21, 1914.)

A series of cases of appendicitis occurring in children, treated at the Aberdeen Royal Hospital for Sick Children. Out of a total of 200 cases 125 were admitted and operated on during an acute attack.

The mortality in the acute cases was 19, or 15 per cent., which included one death under an anesthetic. Two deaths occurred from intestinal obstruction complicating appendicitis—two from subphrenic abscess. The other fatal cases were cases of diffuse peritonitis or of multiple abscesses. In these cases, with one exception, the symptoms had been present to some degree for several days before admission. In the chronic and recurrent cases there was no mortality.

No case of "ether pneumonia" or "bronchitis" occurred in the whole series.

The appendix was not removed in any case where there was an abscess adherent to the anterior abdominal wall nor in several cases of localized abscess not adherent to the anterior abdominal wall. In all the other cases it was removed.

He states that the percentage of diffuse peritonitis is much greater in children than in adults and gangrene and perforation are extremely common. A consideration of these cases justified the following conclusions:—

That acute appendicitis in children is not uncommon.

That it is possible to recognize it with greater accuracy than was previously the case.

That a great number of cases will end in diffuse peritonitis.

That it is impossible for anyone to correctly prophesy how any given case may terminate.

That complaint of abdominal pain, especially when accompanied by sickness, should always provoke most careful inquiry and examination.

That increasing appreciation on the part of the laity of the possible significance of these symptoms is tending to lessen the death rate from appendicitis.

In such cases until acute appendicitis can be excluded by the medical attendant the patient must be kept under especially careful observation, and when appendicitis has been diagnosed, or even strongly suspected, the case should be treated surgically.

E. T. WYMAN.

THERAPEUTICS.

HESS, ALFRED F., M.D., NEW YORK: THE MOUTH-DRIP: A METHOD OF ADMINISTERING FLUID TO INFANTS IN GASTROENTERITIS (ALIMENTARY INTOXICATION). (*Journal of American Medical Association*, February 7, 1914.)

The author uses this method in cases of acute gastrointestinal disturbances in children in which fluid depletion constitutes the greatest danger to the infant's life. It is also of use in the condition termed by Finkelstein "alimentary intoxication." The apparatus used is the same as that used in the Murphy drip-method, with the exception that a rubber nipple is substituted for the hard rubber nozzle. The drip is so regulated by means of a cock that the child receives from 25 to 30 drops per minute of fluid—either hypotonic salt solution or water to which a small amount of saccharin has been added. This facilitates the introduction of large quantities of fluid and is especially applicable to hospital wards where infants cannot have the individual attention of the nurse. HAROLD R. MIXSELL, M.D.

NICHOLSON, S. T., JR., M.D., AND HOGAN, JOHN F., M.D., BALTIMORE: EFFECT OF LACTIC ACID BACILLI ON DIPHTHERIA. (*Journal of American Medical Association*, February 14, 1914.)

A live lactic acid bacillus spray was used as an over-rider in addition to the regular routine of saline irrigations and sprayings with liquor sodii boratis compositus and liquor iodi carbolatus and occasional swabbings with 5 per cent. silver nitrate solution. The antitoxin was of course used. The results of the use of the lactic acid bacillus and sour milk in the 9 cases reported were encouraging, the patients being kept in the hospital a shorter period of time than formerly.

HAROLD R. MIXSELL, M.D.

VEDDER, EDWARD B., M.D., WASHINGTON, D. C.: ORIGIN AND PRESENT STATUS OF THE EMETIN TREATMENT OF AMEBIC DYSENTERY. (*Journal of American Medical Association,* February 14, 1914.)

Pelletier, in 1817, described an alkaloid in ipecacuanha which he called emetin. This alkaloid has recently been proved to be a mixture of three alkaloids, emetin, cephalin and psychotrin. In 1910 experiments were undertaken to determine the effect of ipecac and its alkaloids on amebic and bacillary dysentery. The results show the following facts:—

(1) Emetin is a true specific in amebic dysentery and hepatitis, and the results obtained by its use compare very favorably with the results obtained with salvarsan in syphilis.

(2) It possesses no action on bacillary dysentery.

(3) The hypodermic use of the hydrochlorid salt is the preferred method of treatment.

(4) A large percentage of the cases so treated continue to harbor "entameba histolytica" (often in the encysted and most dangerous form) in the feces for some time.

(5) The prospects for obtaining permanent cures by this method are encouraging.

(6) The presence of a considerable number of these chronic ameba carriers constitutes a sanitary menace to the community.

(7) It is possible that the amebæ may be removed from these carriers by a course of irrigations of quinin and silver nitrate.

(8) Experiments have failed to show that emetin possesses any marked therapeutic value in bacillary dysentery, syphilis, rabies or trypanosomiasis. HAROLD R. MIXSELL, M.D.

ORTHOPEDIC SURGERY.

WHILBECK, BRAINERD H.: THE IMPORTANCE OF THE TREATMENT OF WEAK FEET IN CHILDHOOD. (*New York State Journal of Medicine,* January, 1914.)

Brainerd H. Whilbeck urges the early treatment of flat foot in childhood in order to prevent more serious trouble in adult life. He points out particularly a type of weak-foot in which the arch is present, but in which persistent attitude of outward rotation of the leg and abduction of the foot is assumed. This condition very often is not recognized and the absence of the true flat-foot frequently leads the physician to a faulty diagnosis of rheumatism.

The symptoms of weak-foot in childhood are more those of awkwardness, weakness and fatigue. Pain is not often complained of, though sometimes met with in cases where the arch is present but the foot is abducted. "Toeing-in" is a less objectionable attitude, as it guards the feet against any increase of the deformity.

Deformities of the lower extremities are often seen secondary to a condition of weak-foot. A mild case of knock-knee may be caused from the incorrect attitude assumed in weak-foot. Bow legs often bring about a compensatory weak-foot if long persistent. With the feeling of fatigue as the child grows older is the tendency to round shoulders.

When the child begins to walk a proper shoe should be supplied. The toes should have sufficient room for their free movement. The outline of the shoe should be straight, the shank high and narrow, sloped to the outer side. The forward part of the sole should slope slightly outward, thus aiding adduction. The high-faced boot is preferable to the Oxford tie.

To correct deformity in order to throw the weight to the outer side of the foot the inner border of the sole is raised one-quarter inch, thus tending to bring about adduction. When the child reaches the age of four or five exercises may be used with decided benefit.

The Whitman brace may be used to hold the foot in proper attitude at all times. It is so constructed as to correct abduction and at the same time does not restrict the free action of the foot in the corrected position. Braces should be worn from six to eight months, when new casts are taken and new braces made because of change in the foot and growth of the child. Brace treatment should be kept up four to five years or longer, then inner border of the shoe may be raised to hold the foot in adduction. Extreme cases of spasm will require an anesthetic manipulation. E. T. WYMAN, M.D.

EPIDEMIOLOGY.

ARMSTRONG, DONALD B., M.A., M.S., M.D.: THE HOUSE-FLY AND DIARRHEAL DISEASE AMONG CHILDREN. (*Journal of American Medical Association,* January 17, 1914.)

In an Italian district of the Bronx two areas were selected, each containing 311 families with 1,725 individuals, 362 of them being children under five. In one area every effort was made to prevent filth transmission by the fly. In the other the usual unsanitary course was allowed to proceed. To educate the people in the "protected" area, oral and written instruction were supplemented by moving-picture films. All doors and windows were screened and fly-traps were constructed in the courts, yards and stables. The records of morbidity and mortality were taken from July 21st to September 13th. These were compared and the relationship of flies to diarrheal disease in infants was evident. It was found that in the "protected" area there were 20 cases of severe diarrheal disturbances in infants under five, while in the other area there were 57. It was further found that in the "protected" area the total days of sickness were 273, or thirteen and three-quarter days per case as compared to 984, or sixteen and one-third days per case average. About the same number of infants in either area were breast fed. There is no doubt that the improved sanitation also increased the general physical welfare of the people in the protected district, there being 110 cases of illness there as compared with 165 in the outside families. HAROLD R. MIXSELL, M.D.

MEDICINE.

TUGENDREICH, GUSTAV: ZUR PROGNOSE DER SAUGLINGSTUBERCULOSE. (PROGNOSIS OF TUBERCULOSIS IN INFANCY.) (*Archiv. für Kinderhk.*, 1913, p. 742.)

The reaction of von Pirquet teaches us that in spite of a positive outcome in infants many infants survive the first year, and they do so without any specific treatment. Schick and Pollak reported 96 infants who gave a positive von Pirquet. Of these, 29 survived the first year, 19 the second year and 3 the third year. Of 10 cases with positive von Pirquet, observed by the writer, 9 died—5 in the first year, 2 in the second, 1 in the third, and 1 in the fourth. The tenth was alive and well at four years. In 6 of the 10 cases the father or mother had tuberculosis. In one case the grandfather was tuberculous. Only in 2 cases a tuberculous history could not be obtained. The causes of death were: The meningitis (1), bronchopneumonia (2), marasmus (7), one consequent to operation for P. O. M. Of those who died at the age of over one year, 1 died of bronchopneumonia (non-tuberculous), 2 died of scarlet, 1 of diphtheria. On autopsy the case which died of bronchopneumonia showed no tuberculous lesion. "Therefore, one of those rare, but already frequently reported cases, in which, in spite of the presence of a positive von Pirquet, no tuberculous lesions were observed." (Recently Holt has reported such a case.) Of the infants who died under one year the cause of death was some form of tuberculosis; whereas the infants who died over the age of one year died of some intercurrent disease. MARK S. REUBEN.

CZERNY, AD.: ERFAHRUNGEN ÜBER DEN VERLAUF DER TUBERCULOSE IM KINDESALTER. (EXPERIENCES ON THE COURSE OF TUBERCULOSIS IN CHILDREN.) (*Archiv. für Kinderhk.*, 1913, p. 242.)

In children tuberculosis of bone, superficial lymph glands, and the skin, usually runs a benign course; whereas tuberculosis of the internal organs, the meninges, the lungs and the intestine often lead to a fatal termination. The X-ray often shows tuberculosis of the lungs in cases where it is not suspected; he is therefore of the opinion that tuberculosis of the internal organs, as well as tuberculous lesions of bones and skin, show an "extraordinary tendency" to heal. Tuberculosis affects children with good nutrition as well as those who are under-fed; and he often observed children who were much under-fed and under-weight who never showed any tuberculous lesions. Tuberculosis runs a much milder course in children who have a stable nervous system.

Treatment in a sanitarium has many advantages, but in the private home, under auspicious surroundings, good results may be obtained. The most important need of a sanitarium is that it should be so located as to prevent accidental diseases. (Avoid places where there are sudden changes of temperatures). Another requisite is plenty of fresh air and sun. He believes that the good results of Rollier are mostly due to good air and good food and not so much to the sun treatment. He does not believe in the tuberculin treatment; that is, he has seen no better results with its use than without it. He believes there is no justification for the use of tuberculin as a prophylactic measure. "While the advantage of such injection has never been demonstrated, it has produced an irritation and a lighting up of an old process."

The diet should be such as to prevent rapid gain of weight; for the more rapid the gain the greater the water content of the body, and this leads to diminished resistance. He tries to influence more the consistency of the body than its weight. This result he obtains by the use of a diet poor in carbohydrates and rich in proteids. MARK S. REUBEN.

CHAPIN, C. E.: AERIAL INFECTION. (*Journal of American Medical Association*, February 7.)

Chapin gives a general review of the facts regarding infection through the atmosphere. This includes the subject of dust and droplet infection, the importance of which, in his opinion, has been overestimated. The question of dosage in causing disease is all-important, but qualitative studies have been somewhat neglected. He gives the substance of Winslow's experiments in support of his own view, maintaining that the precipitation of germs in indoor dust, which has been allowed to accumulate, is no indication of the number in the atmosphere at any one time. He reviews the facts of the carriage of infectious disease in various conditions of typhoid fever, malaria, small-pox, the modern abandonment of the spray method in aseptic surgery and finds but little reliable evidence of aerial conveyance except in a few conditions, like bubonic plague, even of the more resistant bacilli like those of tuberculosis and diphtheria. There is still some difference of opinion among physicians in regard to chicken-pox, measles, rubella, etc., but the evidence is not, he thinks, conclusive. He concludes that aerial transmission of disease is rarely an important factor except possibly in tuberculosis, but the last word has not been said in regard to this disorder.

MORSE, JOHN LOVETT: DIABETES IN INFANCY AND CHILDHOOD. (*Boston Medical and Surgical Journal,* April 10, 1913, p. 530.)

The author reviews the literature and adds statistics from his own cases. It is very evident that diabetes does occur in childhood and probably more often than is suspected. The incidence of the disease is essentially the same in both sexes, while the frequency of the disease seems to increase directly with age. The etiology is the same as in later life. The predisposition of the Jewish race to the disease is, however, not evident in early childhood. Heredity is an important factor; there was a history of diabetes in the family of thirty-one of the author's series. Familial juvenile diabetes is relatively frequent, heredity playing a very important part in this type, as in this form all the children in the family are attacked in more than 50 per cent. of the cases. Trauma sometimes is an important factor. It is probable that the long-continued excessive consumption of sugar may play a part in the production of the disease. Such a history was present in 6 of the author's 19 cases.

The symptoms are in the main the same as in the adult. Polyphagia is perhaps more common, while marked changes in the disposition are very common. Enuresis is often the first symptom noted, as is the presence of flecks of sugar on the clothing or floor. Another early suspicious symptom is irritation of the external genitals.

The onset is usually described as acute. It is, however, less often so than supposed, because what is taken for the onset is not infrequently the change from the mild to the severe type of the disease. It was formerly supposed that almost all of the cases were of the severe type, but more recent studies show that the two types are about equally common in the beginning, with a greater tendency for the mild to change to the severe than in later life.

It is difficult to state the duration of the disease. In general the younger the child the shorter the duration. The prognosis is almost uniformly bad, but there are exceptions in a few apparently severe cases which are known to have recovered.

The diagnosis of the disease is made upon finding sugar in the urine of any child with symptoms suspicious of the disease. The diagnosis upon finding sugar in the urine without other symptoms of the disease is not justified because a temporary glycosuria as the result of overstepping the limit of tolerance is not uncommon in childhood.

A number of cases of diabetes in infancy have been reported. There is nothing to show, in the vast majority of these cases, that the sugar was dextrose and not lactose or galactose, and it is therefore probable that most of these were cases in which the assimilation limit for lactose was overstepped and that they were not true diabetes. A number of true cases of diabetes in infancy have, however, been reported in which the urine contained dextrose. Both dextrose and lactose precipitate Fehling's solution on boiling. If a positive test for sugar is obtained the urine should then be boiled for three minutes with an equal amount of a 10 per cent. solution of sodium hydrate. Hot Fehling's solution should then be added and the mixture again boiled. A positive reaction then means the presence of lactose.

The treatment of diabetes in childhood is the same as in later life.

WILLARD S. PARKER.

TALBOT, FRITZ B., AND SISSON, WARREN H.: SOME FACTORS WHICH INFLUENCE THE EXCRETION OF FORMALIN IN THE URINE OF INFANTS AND CHILDREN TAKING HEXAMETHYLENAMIN. (*Boston Medical and Surgical Journal,* April 3, 1913, p. 485.)

Burnham and L' Esperance found that only 60 per cent. of adults were able to break down hexamethylenamin. Burnham found that only 20 per cent. of adults showed decomposition of the drug into formaldehyde when given in doses of 5 and 10 grains three times daily; 60 per cent., however, showed it when the drug was given in doses of 20 to 30 grains every four hours. Some individuals given 100 grains at a single dose did not excrete formalin. Burnham believes that formaldehyde liberation is due to some specific action of the renal epithelium. The greatest decomposition has been observed in highly acid urines.

The authors made examinations of 400 single specimens of

44 babies and children in the wards of the Massachusetts General Hospital. They found, with two exceptions, that all the urines containing formaldehyde were acid and that all alkaline urines were negative; 127 acid urines contained formaldehyde, 83 did not. Two faintly alkaline urines showed formaldehyde; there were 56 negative alkaline urines and with the above noted two exceptions no positive ones. Eight neutral ones were negative. Alkaline and faintly acid urines, giving a negative test, reacted positively after the addition of sulphuric acid and boiling.

Acid urines reacting positively became negative when enough alkali was administered to make the urine alkaline. All the children excreted formaldehyde at some time. The authors conclude:—

(1) That all children can break down hexamethylenamin, and therefore excrete formalin.

(2) That relatively large doses are often necessary before the excretion of formalin takes place.

(3) The more acid the urine the greater the decomposition of urotropin and the excretion of formaldehyde.

(4) Since others have shown that the antiseptic power of urotropin is dependent on its being broken down into formaldehyde, urotropin should not be given with drugs which cause the urine to become alkaline. WILLARD S. PARKER.

TALBOT, FRITZ B., DODD, WALTER J., AND PETERSON, HUGO O.: EXPERIMENTAL SCORBUTUS AND THE ROENTGEN RAY DIAGNOSIS. (*Boston Medical and Surgical Journal,* August 14, 1913, p. 232.)

The authors review the literature of scorbutus and the bone changes found in this disease. Chief of these is the "white line," an area of increased density, at the junction of the diaphysis and the epiphysis, appearing before any of the cardinal symptoms of scorbutus and persisting long after complete clinical cure. The writers have observed the white line in several cases, and since the work on scorbutus have observed the "white line" in several cases of congenital syphilis. These cases may have had early scorbutus. Further observation must determine whether the "white line" has any connection with rachitis and syphilis or whether it is present only in scorbutus.

Halst, Frohlich and Von Furst fed guinea pigs on various forms of bread and grain. The pigs died in from four to six weeks with a disease in which the pathological anatomy corresponded with that of human scorbutus, namely, hyperemic gums with microscopic hemorrhages, extravasations of blood about the costochondral articulations and in the soft tissues about the joints, subluxation of the epiphyses, characteristic changes in the bone marrow. These changes were not due simply to starvation, as guinea pigs fed on fresh cabbage, dandelions and carrots lost 30 to 40 per cent. of their weight, but showed no such changes. Scorbutus in guinea pigs is cured by fresh vegetables, as in the human. Fresh vegetables lose their antiscorbutic effect in varying degrees when dried or cooked. Lemon juice withstands for a long time the same degree of heat which destroys the antiscorbutic property of vegetables.

The authors fed three lots of guinea pigs—one on oats and water alone, one on rye bread and water alone, the third on white bread and water alone. Death occurred in all in thirty to forty-five days; most of the animals showed pathological changes characteristic of scorbutus, and some showed the "white line."

In 1911 Hart fed a monkey on condensed milk and it died of typical scorbutus, while a control monkey which received a mixed diet did not. The authors fed a young Java monkey on condensed milk. The control was fed on cow's milk, carrots, raw apples, bread and bananas. It developed no disease. The one fed on condensed milk developed clinical signs of scorbutus and died after three months of the diet. Pathologically, there was no definite proof of scorbutus, but the whole picture was suggestive of infantile scurvy. Radiographs during life showed no characteristic changes; the plate taken just after death showed the "white line."

The authors concluded: The "white line" is a constant sign in infantile scorbutus and may be produced experimentally in the guinea pig and monkey. It may persist months after clinical cure, suggesting that the repair is very slow. Scorbutus may be produced in guinea pigs and monkeys. WILLARD S. PARKER.

D' ESPINE, PROFESSOR DR. ADOLPHE: BANTI'S DISEASE IN INFANCY. (LA MALADIE DE BANTI CHEZ L' ENFANTS.) (*Archiv. für Kinderhk.*, May, 1913, p. 254.)

The writer reports 2 cases of Banti's disease in infants and summarizes the literature of this disease in children. In all there are 24 cases of this disease in children recorded; 8 of these were in infants under two years. The first case of the writer was a boy eleven months old, who had a very marked anemia and a very large spleen; abdominal enlargement was first observed at seven months; liver also enlarged; the anemia was progressive; it varied from: hemoglobin, 38-30 per cent.; red blood corpuscles, 3,410,000-2,703,000; white blood corpuscles, 10,075-8,370. During the six months at the hospital the liver and spleen continued to enlarge; there were venules on the abdomen. Toward the end of the disease the infant had hematemesis and melena. At eighteen months the infant contracted pertussis, and one month later died of bronchopneumonia. Autopsy revealed the character lesions of Banti's disease. The spleen weighed 145 gms; the liver 340 gms.

The second case was a girl fifteen and one-half months old; had marked rickets; the infant had a prominent abdomen; anemia was severe. and the spleen was enlarged; no mention is made of hepatic enlargement. von Pirquet reaction strongly positive. Wassermann reaction negative. Splenectomy was performed. Two months after splenectomy infant developed pertussis and died of bronchopneumonia. The blood before operation was: hemoglobin, 45 per cent.; red blood corpuscles, 3,700,000; white blood corpuscles, 13,640. After splenectomy blood was: hemoglobin, 50 per cent.; red blood corpuscles, 2.660,000; white blood corpuscles, 33.720. Autopsy revealed the characteristic lesions of Banti's disease.

A resumé of the reported cases tends to show that these cases may begin early in infancy and continue for many years (ten to fifteen years); leukopenia is a marked symptom; ascites was present in half the cases; hemorrhages in form of epistaxis. hematemesis and melena are usually present; the spleen and liver are usually enlarged; the hepatic enlargement usually goes on to an atrophic cirrhosis. In 9 of these cases splenectomy was performed with ultimate recovery. MARK S. REUBEN.

LINENTHAL, H. L., AND JONES H. N.: A SIMPLE AND EFFECTIVE METHOD FOR DISINFECTION OF TYPHOID STOOLS. (*Boston Medical and Surgical Journal*, January 8, 1913, p. 48.)

The immediate destruction of the typhoid organism in the excreta of the typhoid patient is one of the most important steps in the control of typhoid fever. In the vast majority of cases of typhoid ill at home effective disinfection of stools is not carried out, and the ineffective methods lead to a false sense of security which is dangerous. Only a small part of the stool is subject to the action of the usual disinfectant. Heat, boiling water or steam, is the only effective agent in dealing with the typhoid stool. This is obviously not practical in the household. An effective and simple method was devised by Dr. Kaiser, of Gratz University. It consists of adding enough hot water to cover the stool in the receptacle and then adding about one-fourth of the entire bulk of quick lime (calcium oxide), covering the receptacle and allowing to stand for two hours. The hydration of the lime generates enough heat to destroy the typhoid and all other organisms except spore-bearers. The authors proved the test efficient by experiments. WILLARD S. PARKER.

FLOYD, CLEVELAND: SOME RESULTS OF DISPENSARY WORK IN THE CONTROL OF TUBERCULOSIS. (*Boston Medical and Surgical Journal,* January 9, 1913, p. 43.)

In the work as carried on in Boston it has been the routine to examine families as complete units where tuberculosis existed. In the present series of cases there were 1,563 children. Of these, 302 were found to have pulmonary tuberculosis, 386 were suspected, 875 negative cases. A history of exposure was obtained in 684 cases. In a previous study of the morbidity of tuberculosis as the result of family infection pulmonary signs were found in between 30 and 40 per cent. of the children. After a sufficient period of observation only 40 cases of phthisis developed where it was not detected on the first examination. The great majority of positive cases have been completely arrested. It is evident that the work of prevention among children is of great promise. The ideal system is hospital isolation for every case of danger to the community. Statistics show that the dispensary has a valuable place in the prevention of tuberculosis, not so much in the number of "cases cured" as along the lines of diagnosis, isolation and prevention. WILLARD S. PARKER.

LOVETT, ROBERT W., M.D.: PRINCIPLES OF THE TREATMENT OF INFANTILE PARALYSIS. (*Boston Journal of American Medical Association,* January 24, 1914.)

The author draws the conclusion that in all suspected cases of infantile paralysis hexamethylenamin is desirable. When the disease is acute, absolute rest, with light feeding and catharsis, is required until all tenderness has disappeared. Contraction of the tendo Achilles can be obviated by stretching or by immobilizing the foot at a right angle to the leg.

When tenderness has disappeared, measures at hand are massage, electricity and muscle training, the last named being the most valuable.

In connection with muscle training, braces and apparatus are often necessary. By inducing an upright position they increase muscular activity. Operation is indicated:—

(1) To correct fixed deformity by stretching or cutting tendons.

(2) To improve muscular function by tendon transplantation.

(3) To secure stability of useless joints by artificial ankylosis.

By intelligent treatment good results can be obtained and there seems to be no time limit to improvement.

HAROLD R. MIXSELL.

GOODALL, HARRY W.: RECTAL ALIMENTATION. (*Boston Medical and Surgical Journal*, January 8, 1914, p. 41.)

The author gives a complete review of the knowledge concerning absorption of nutritive material from the large intestine. The excretory function is the greatest function of this part of the bowel. As a digestive organ it plays a very small part, as most of digestion is completed in the small intestine, and what takes place occurs by means of ferments passed along from the small gut. Carbohydrates and proteins are, however, broken down by bacteria normally present in the large gut. As an absorbing organ it is of little importance. Very little absorption of food takes place; about 80 per cent. of the water passing the ileocecal valve is absorbed.

From experimental evidence it may be stated that water and salts are rapidly absorbed by the large bowel. Amino-acids and monosaccharide sugars are slowly absorbed,, but promptly enough to permit giving enough to meet nutritional requirements. Alcohol is readily absorbed. Fats are too slowly absorbed to be of any value.

The feeding of protein broken down into amino-acids and the introduction of pancreatic extracts with protein has not been found practical. For practical purposes the only rational enemata consist of water, salts, simple carbohydrates and alcohol. An enema of the following proportions has been found in adults to yield the greatest absorption with the least irritation:—

Dextrose	50 gms.
Absolute alcohol	50 gms.
Water	1,000 c.c.

Smaller enemata of the same proportions would be indicated in children. If the concentration of this enema be increased then absorption is not complete.

If the demand for sugar is urgent it can be supplied by subcutaneous injection in isotonic 5.4 per cent. solution. The following solution is advised in children and weak adults for intravenous use:—

Dextrose	55.0 gms.
KCl	0.2 gms.
$CaCl_2$	0.2 gms.
$NaHCO_3$	0.1 gms.
Ag. Dest.	1,000.0 c.c.

WILLARD S. PARKER.

MISCELLANEOUS.

CURTIS, F. G.: SHALL WE CLOSE THE SCHOOLS DURING EPIDEMICS? (*American Journal of Public Health,* Vol. IV., p. 135.)

Curtis concludes that keeping the schools open during an epidemic of scarlet fever offers the best method of checking it quickly. If the schools are kept open and the children continue in the class-rooms they are under strict observation and are examined daily by the school physicians. In this way many children are sent home before they have had an opportunity to infect others. If the schools are closed when an outbreak occurs the children are turned loose from supervision, and mingle freely with one another in the streets, on playgrounds, and in each other's houses. He mentions two instances where outbreaks were due to missed cases which were in the schools for some time before discovery; the first cases found were not children who sat near the infecting cases, nor were they in the same grade, but were those who were their playmates and companions out of school.

J. HERBERT YOUNG.

ARCHIVES OF PEDIATRICS

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EDITORIAL

A CHANGE NEEDED IN OUR ATTITUDE TOWARD MEASLES AND WHOOPING-COUGH.

Physicians are supposed to be the leaders of the community in matters of hygiene and the prevention of disease. We have said many times that the medical profession is the only one whose members have as the ideal toward which they strive the diminution and possible elimination of the need for their services. Physicians themselves with considerable complacency are wont to accept this view of themselves whether they really deserve it or not. It is wholesome, then, perhaps, for the physician occasionally to realize that before he became a physician he was a layman and that still he has points of view which are more those of the layman than scientific facts should allow him to have. Instance his attitude toward two of the contagious diseases—toward measles and whooping-cough. Here the attitude of many physicians needs a right-about-face. They are much too prone to regard these diseases as constant accompaniments of childhood, and to underestimate their seriousness. Almost everyone has had measles; and nearly as many have had whooping-cough. That so many have had these diseases and are alive to tell the tale makes them commonplace and it is difficult to awaken enough interest for an adequate consideration of them. They are so often mild that it needs some exploitation of their dangers and disasters now and then to stimulate us all to give them the study and respect they should command. Dr. Morse is eternally right when he says that a child dead of whooping-cough is just as dead as if dead of the plague and that a total mortality due to plague as large as that yearly caused by whooping-cough would cause a quarantine against us by all the nations of the earth.

We fear scarlatina in spite of the fact that as a cause of mortality it has been steadily falling lower in the list. We fear diphtheria and know only too well that, although, thanks to von Behring and O'Dwyer, we can save life where our predecessors failed, it is an ever present menace and its incidence seems to change but little. We shall have to grant to scarlet fever and diphtheria a greater general case mortality than to measles and whooping-cough, but they are not nearly so prevalent as measles and whooping-cough, and while of every 100 children who have scarlet fever 12 to 14 die and nearly as many who have diphtheria, yet there are more hundreds who have the less seriously considered diseases, and the total of deaths due to measles and whooping-cough approaches, and may even exceed, that due to their darker sisters.

Dr. George N. Wilson, writing in *Public Health* in 1905, said in substance: "Measles is probably the most universal of infectious diseases in this country (England) and the case mortality, though greatly less than that of some more dreaded diseases, is yet not inconsiderable. Most children have measles before their eighth year and the total number of deaths in the course of years is so great as to demand for the disease a foremost place in the consideration of hygienists and the community. In Aberdeen, from 1895 to 1905, measles caused more deaths than any other single infectious disease, and even more than all the others together, if whooping-cough be excluded."

Dr. Claude B. Ker, of Edinburgh, says of whooping-cough: "Those who only see whooping-cough in good class practice do not perhaps realize how serious it is liable to be in the children of the poor. The mortality in Edinburgh for a period of five years ending 1900 was 48 per 100,000 persons living; in fact nearly one-third of the whole infectious disease rate was caused by this disease. As the children of the better class usually survive an attack this means that the slum population suffers very severely indeed."

In Massachusetts, from 1901 to 1908 inclusive, there were 2,765 deaths from scarlet fever, 2,500 deaths from measles, and 2,563 deaths from whooping-cough. In Philadelphia, from 1903 to 1908 inclusive, there were 1,302 deaths from whooping-cough, 1,054 deaths from measles and only 784 deaths from scarlet fever, or almost twice as many due to whooping-cough as to scarlet fever.

In Pennsylvania as a whole for the years 1906, 1907 and 1908 the mortality was as follows:—

1906	Whooping-cough	caused	1,550	deaths
	Measles	"	1,463	"
	Scarlet fever	"	577	"
1907	Whooping-cough	"	1,287	"
	Measles	"	714	"
	Scarlet fever	"	657	"
1908	Whooping-cough	"	1,264	"
	Measles	"	1,215	"
	Scarlet fever	"	1,217	"

(there being an epidemic)

Concerning these figures the Commissioner of Health for Pennsylvania in the Report of the State Board of Health for 1907 said: "Measles carried off 714, a decrease of more than half as compared with the previous year, in which a great epidemic prevailed; but still more than scarlet fever, a disease much more dreaded by the people." And again, "Whooping-cough was responsible for 1,287, a decrease of 263 as compared with 1906. It will be noted that these two diseases, measles and whooping-cough, which the public and too often the medical profession are accustomed to trifle with, taken together destroyed 2,001 lives, or more than three times as many as scarlet fever, which is always, and very properly, taken seriously."

The seriousness of both of these diseases could hardly be better demonstrated.

There are certain other facts in relation to these two "trivial" diseases which are brought out in interesting fashion by statistics gathered in Aberdeen. There, for a period of twenty years compulsory notification of measles and whooping-cough was in effect. It was noted that there was a periodicity in the occurrence of epidemics of these diseases. Every two years, although the disease was always present, there was an increase in the number of cases of whooping-cough reaching to epidemic proportions. Then, almost without fail, two months or so afterward there was an epidemic of measles, a relationship that has been noted in this country as well.

The mortality of these two diseases considered in relation to age shows that with measles, of children under one year who took the disease, 13.9 per cent. died; from one to two years, 10 per cent.; from two to three years, 3.4 per cent.; from three to four years, 1.6 per cent.; from four to five years, .9 per cent.; while after eight years of age the mortality was negligible.

In the case of whooping-cough, of children under one year who took the disease, 12.9 per cent. died; from one to two years, 10.1 per cent.; two to three years, 3.3 per cent.; three to four years, 2.2 per cent.; four to five years, 1.6 per cent., while after that the mortality was almost *nil.* This means that in the first two years of life the case mortality (irrespective of the greater frequency of occurrence of these diseases) is quite as high as the general case mortality of scarlet fever and diphtheria; and that a child under a year is eight times as liable to die from whooping-cough as a child of four or five; and fifteen times as liable, if he contracts measles.

Moreover, whooping-cough causes more deaths in children under one year than any other infectious disease. It is also particularly fatal in the first three months of life, when the case mortality is 18.2 per cent. Measles is also very fatal during the first year, but the greatest number of cases of measles are contracted between the ages of two and five years, so that its total death rate is greater at those ages. But between nine and twelve months of age its case mortality is over 18 per cent.

These figures are important, for they show the great danger from measles and whooping-cough to children of the first five years, and especially of the first three years. It is not so much a school problem as is the case with scarlet fever and diphtheria, except as the kindergarten enters into it. If a child can be kept from infection until he is five years old he may have either of these diseases almost, though not quite, with impunity.

Another application of the dictum that public health is purchasable is apparent when statistics as to social conditions and mortality are examined. In Aberdeen, of children who contracted measles, of those who lived in homes of five rooms or more, .8 per cent. died; in four rooms, .9 per cent.; in three rooms, 1.8 per cent.; in two rooms, 3.0 per cent.; in only one room, 6.8 per cent. This means that for every child living in a four or five room house who died from measles, 7 died in the one-room house. Of the children who contracted whooping-cough, of those who lived in five-room houses, 2.2 per cent. died; in four rooms, 3.4 per cent.; in three rooms, 4.5 per cent.; in two rooms, 5. per cent., and in only one room, 7.8 per cent. This means that the child in the one-room house had hardly more than one-quarter the chance of life that his better situated brother has, but also shows that even among the better classes whooping-cough is less affected by environment than measles. Elsewhere in this number there is more, and to better effect, concerning whooping-cough, and we are glad to be able to bring such authoritative articles to the ARCHIVES' readers.

The need of hospital facilities for these two diseases is a crying need and is met so poorly in all parts of the country that all we can say and keep saying will not be too much. A measles hospital must have light and air and space in abundance, or it is far worse than no hospital. There have been measles hospitals where the mortality was so high that it was almost equivalent to signing a death warrant to send a child there. The need for measles is indeed greater hospital facilities, but even more emphatic than that is the need for better facilities in existing hospitals, the elimination of crowding, the introduction of sunlight and fresh air. Only by these means may the hospital mortality of measles, often reaching 30 to 40 per cent., be brought to a decent rate.

With whooping-cough the need is for hospitals of any kind, for there is almost no provision made at all. Think of ten beds for whooping-cough in a city of 5,000,000! Recall, if you will, case upon case of pneumonia complicated with this terrible disease dying in its tenement home because the child could not be taken into a hospital, must not be brought to a dispensary, and the parents could not afford regular medical attendance, not to speak of competent nursing. Everyone of us has had such an experience.

It is indeed unfortunate that, as Dr. Pisek has said, whooping-cough is accompanied by no dreaded eruption to emphasize its danger. Likewise it is unfortunate that the eruption of measles is not sufficiently dreaded. It is the duty of "the man who knows" to see that these popular—and too often medical—attitudes of mind are changed so that in prevention, quarantine and treatment measles and whooping-cough may be brought up to the level upon which are placed scarlet fever and diphtheria.

ORIGINAL COMMUNICATIONS

THE ETIOLOGY OF PERTUSSIS.*

BY ANNA WESSELS WILLIAMS, M.D.

We are still reporting only that we are *nearing* the time when we can fully demonstrate the specific etiologic factor in whooping-cough. We are continuing to add evidence, it is true, but this evidence does not yet amount to proof.

I wish briefly to state what we lack for complete proof of a specific cause of pertussis and to give some of the reasons for our incomplete knowledge.

First, we lack the demonstration of the same microörganism in every case of pertussis. The bacillus described by Bordet and Gengou has been reported by most observers as more frequently present than any other organism except those belonging to the influenza group in the narrow sense, that is, to the group of hemoglobinophilic bacilli; but many of these reports are based upon morphologic findings in direct stained spreads; and by the microscopic method alone it is not possible, in many cases, positively to differentiate between the Bordet-Gengou bacillus and a large number of minute Gram-negative morphologically similar bacilli (chiefly of the influenza type) which are found in the respiratory tract of human beings, particularly in the latter stages of any inflammatory process. And many of these reports are based upon the findings made *late* in the disease. Very few cases have been examined from the *beginning* of the disease to the end. Then, too, very few cases die in the early stages of the disease, so our autopsy findings also are complicated by these mixed infections which seem to be the direct cause of death in the majority of cases. Probably no case of pertussis is uncomplicated from beginning to end. The respiratory tract is too favorable a medium for the growth of many bacteria to allow one infection to proceed by itself. In order, then, to determine the presence of a specific microörganism in infections in this locality, we should be able to study the cases from the beginning, under favorable conditions, for isolation and observation. Cases occurring in well-to-do, intelligent families are better suited for this purpose than those occurring in poor, over-crowded homes, or in institutes or hospitals where they cannot be properly isolated. The practicing physician should be able to help us obtain these favorable cases. The ideal place for this study is a special hospital, such as a well-equipped boat or such as isolated rooms in a suitable hospital where the children could be treated and studied with sufficient controls. Bordet called attention to the necessity of studying the cases under these conditions in his early reports.

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* Read before the New York Academy of Medicine, Section of Pediatrics, April 9, 1914.

So far in our studies now being carried on in the Research Laboratory of the Health Department, our results strongly emphasize the truth of this observation. Thus, most of the cases where we have obtained an abundant and almost pure culture of a bacillus answering to the description of Bordet and Gengou have been cases that occurred in the homes of the better class of people, and that were examined early in the disease. The Bordet-Gengou bacillus is easily overgrown by other bacteria, so, unless it is present in great numbers, it is difficult to isolate.

The majority of the strains isolated by us have been shown to be a species distinct from the hemoglobinophilic bacilli and from certain other bacilli morphologically similar to the Bordet-Gengou bacillus. Not only are later cultural characteristics different, but these strains produce specific antibodies in experimental animals which give a positive result with the complement fixation test. We have, however, obtained strains from several cases that are not typically like those we call *Bacillus pertussis* (or Bordet-Gengou bacillus), and we are now making minute cross fixation tests of these various strains isolated by us in order to determine the important question of varieties in this species. If the Bordet-Gengou bacillus has specific pathogenic powers in the human being, then the question of different varieties among the strains may be a most important one to settle from the standpoint of vaccine treatment. The evidence we have so far obtained points to the truth of the variety hypothesis. If it proves true, it could explain partly the varying results reported from the vaccine treatment and it would mean that either we must work out a suitable polyvalent vaccine, or that we must use an autogenous vaccine, at any rate in certain cases. In the use of a polyvalent stock vaccine, we may need to determine whether we should continue to use stock cultures to produce it or whether we must at stated times obtain fresh cultures from recent cases.

Our findings have also pointed to the importance of mixed infections in pertussis cases, so, if further study proves the specific action of the Bordet-Gengou bacillus, or group of bacilli, the possibility of needing a mixed vaccine in certain cases must be considered—unless treatment with a suitable polyvalent or autogenous vaccine *given at the very beginning* of the disease proves efficacious. Any and all of these conditions—that is, the lack of a suitable polyvalent or an autogenous vaccine, such a vaccine given early in the disease, and a suitable mixed vaccine in pronounced mixed infection—one or all of these conditions may explain the cause of at least some of the irregular results from vaccine treatment reported by different physicians.

The complement fixation test with the serum of human beings having or having had pertussis is not as clear cut as it so far seems to be with the serum of animals who have been artificially infected with the bacillus pertussis. Of course we would not expect it to be as marked in human beings as in hyperimmunized animals, but we might expect to find true the claim of Bordet and others that this test is positive with the serum of the great majority, if not of all, of the patients after the second week of the disease. Wollstein and others, however, have not obtained these uniformly positive reactions. So we come to our *second important lack* in the proof of the specificity of a definite organism in this disease; that is, a sufficient number of cases studied *completely,* in regard to their serum reactions at different stages of the disease with autogenous cultures and with others. In attempting this study of the patient's serum we are confronted by many difficulties. Parents, not realizing the harmlessness of the procedure, object to the taking of even *one* specimen of blood. Then the question of the best method of making the complement fixation test is still under experiment. Different observers have used different methods of preparing both antigen and serum and have also employed different hemolytic systems. We have found so far, as have others, that many of these methods do not stand the test of sufficient controls. Thus, active serum does not always give a specific reaction, neither does antigen prepared as a suspension, especially if living bacilli be used. The workers at the Research Laboratory who are now studying complement fixation in pertussis have been comparing Dr. McNeil's method of making antigens (that is, by heating at 56°C., filtering, and then re-heating at 80°C., to destroy a hypothetic ferments which seems to make the antigen unstable) with the other methods reported so far as successful by other observers. Our results at present are interesting, but not yet ready for publication.

Our *third* important lack is clear evidence of the specific lesion in pertussis. This question of the histologic pathology of the disease has recently received a new impetus through the interesting hypothesis of Dr. Mallory. Mallory, as you know, claims that a certain number of bacilli between the cilia of the epithelial cells in the trachea and bronchi constitute the specific lesion. He claims that he has fulfilled Koch's laws by the finding of these bacilli in experimental animals in the same situation and by the recovery of the culture from these animals. In his latest communication, however, he acknowledges that his results in animals are complicated by the fact that these animals are frequently infected by the *Bacillus bronchisepticus,* which is morphologically similar to the pertussis bacillus and which apparently has the same power, as Theobold Smith and others have pointed out, to cling to the cilia of the epithelial cells in the respiratory tract. In human beings, Mallory states, judging from the examination of hundreds of controls, only pertussis cases showed this lesion. Of course, we suppose that chief among these controls are cases of children dying of influenza pneumonia. At any rate, these are the cases in which we are most interested as controls. These are the cases, among others, we are planning to examine in order to help us form an opinion of the specificity of Mallory's lesion. As far as examination of pertussis autopsies are concerned we have had so far one suggestive case—the case of a two-year-old child who died in the third week of pertussis, apparently as the direct result of the disease. Unfortunately, as is so often the case, we could not obtain the autopsy until forty-eight hours after death. We had obtained from this case, at the beginning of the second week of the disease, a typical Bordet-Gengou bacillus from the sputum. From the autopsy material, though we made a minute examination of the respiratory tract and lungs, we were only able to obtain, on the Bordet-Gengou medium and other media employed, practically pure abundant growths of a hemoglobinophilic bacillus. Sections of the trachea and bronchi, prepared according to Mallory's directions, showed surfaces mostly denuded of cilia. This of course was very probably a postmortem change in this case. Between the cilia remaining a few minute bacilli were seen which, from morphologic possibilities, would have to be classed with the influenza bacillus.

It seems to us probable that the Mallory lesion will be found to be only a part, and not a strictly specific part, of the whole, and that the specific toxin upon which Bordet insists is an important aid in producing hypersensitiveness of the recurrent laryngeal nerve and its center.

We may conclude from this study of the lack of proof that the specific cause of pertussis is definitely settled. *First,* that, though the Bordet-Gengou bacillus has not been found in the majority of cases of pertussis, it has been found most frequently under the best and most significant conditions and that there are sufficient reasons to account for not finding it under other conditions. *Second,* that the irregular reports given of the complement fixation test in human beings may be accounted for by the different methods used without making comparative studies and sufficient controls, and, more important still, by the occurrence of distinct varieties in the species *Bacillus pertussis. Third,* that the irregular reports given of results from vaccine treatment may be accounted for by the lack of definite group work among physicians, with the establishment of a general plan and sufficient controls in each series of cases studied, at the same time taking into consideration the various points that are still under discussion. *Fourth,* that the hypothesis of Mallory that the essential lesion of pertussis is chiefly a mechanical one, can only be considered as a suggestion for further study in establishing the specificity of the Bordet-Gengou bacillus.

THE INTRAVENOUS USE OF ANTI-DIPHTHERITIC SERUM.—Beyer (*Münch. Med. Woch.,* August 26, 1913, No. 34), in order to compare the effect of diphtheria antitoxin when given intravenously or subcutaneously, studied a series of cases from the same epidemic having as nearly as possible identical clinical symptoms. Half the cases received antitoxin subcutaneously and half intravenously. The first group were given 1,000 to 3,000 units and the second 500 to 1,000. The temperature and local condition of the disease were recorded in each case. Beyer concludes that when the serum was given early in the disease by the intravenous method, the temperature appeared to return to normal somewhat sooner than when it was given subcutaneously, but if given late there was no difference. Antitoxin intravenously or subcutaneously had the same effect on the local condition of the throat.—*Boston Medical and Surgical Journal.*

THE CLINICAL AND SOCIOLOGICAL ASPECTS OF WHOOPING-COUGH.* †

BY JOHN LOVETT MORSE, A.M., M.D.,

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In the year 1906, in a registration area comprising slightly less than one-half of the population of the United States, 6,324 children under five years of age died of whooping-cough. The death-rate per 100,000 in the United States in 1910 was as follows: whooping-cough, 11.4; scarlet fever, 11.6; measles, 12.3, and diphtheria, 21.4. The mortality in children under five years of age in thirty states in 1911 was from whooping-cough, 6,251; scarlet fever, 4,232, and diphtheria, 9,579. 3,860 children under five years of age died of bronchitis and bronchopneumonia during the same period in eleven states in which 1,216 died of whooping-cough. A considerable proportion of these cases were undoubtedly secondary to whooping-cough. These deaths should also be charged to whooping-cough. The relative mortality from whooping-cough, scarlet fever and diphtheria is essentially the same throughout the country, whooping-cough being almost everywhere more fatal than scarlet fever and less fatal than diphtheria. It is an especially serious disease in the Southern States. The death-rate from whooping-cough is, on the whole, higher in the large cities than in the small.

It is very evident from these figures that, instead of being a trifling affair, as it is usually considered to be by the laity, whooping-cough is a most serious and fatal disease. "Any disease which kills 10,000 children per annum is," as Rucker says, "a serious one. If bubonic plague were to kill that many children in the United States in one year, the whole world would quarantine against our country. A child dead of whooping-cough is just as dead as a child dead of plague."

There are certain other points in relation to the mortality from whooping-cough which are also of great importance. German statistics, covering a period of eleven years, show that the mortality among those attacked with this disease is, under one year of age, 26.8 per cent.; between one and two years, 13.8 per cent.; between two and five years, 3 per cent., and between five and fifteen years, 1.8 per cent.

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* Read before the New York Academy of Medicine, Section on Pediatrics, April 9, 1914.

† Much of the material in this paper has already been published in the *Journal of the American Medical Association*, Vol. LX., p. 1,677.

Ninety-six per cent. of the deaths from whooping-cough in the United States in 1906 were in children under five years of age. Fifty-seven per cent. of the fatalities were in the first year, 23 per cent. in the second year, 8 per cent. in the third year, 4 per cent. in the fourth year, and 2.5 per cent. in the fifth year. It is a relatively mild disease in children over five years of age and rarely fatal after puberty. The importance of these facts is in relation to the measures to be taken to control the disease.

What is being done in this country to control this terrible disease? Almost nothing. It is a notifiable disease in only about one-half of the states and in many of these states very little attention is paid to the law requiring notification. Isolation is required by law in only a few states, and in them the isolation is chiefly on paper. The states in which the disease is placarded can be counted on the fingers. Disinfection is required by law in a few states, but for practical purposes apparently amounts to little or nothing.

The attendance at school of children ill with whooping-cough is forbidden by law in most states, but two, at least, have no such law. In almost none of them is it specified, however, how long the children shall be kept out of school. In a considerable number of states the other children of the family are allowed to attend school, whether they have had the disease or not. In some states they are allowed to attend school if they have had the disease; in others, if the patient is isolated.

The regulations of the cities average better than do those of the states. It hardly seems credible, but it is nevertheless true, that children with whooping-cough are allowed to go to school in at least three cities in this country. The other children in the family are allowed to go to school in many cities, whether they have had the disease or not. In a few, they are not allowed to attend school under any conditions. They are permitted to attend in others, if they have had the disease; in others, if the patient is isolated, or after a period of quarantine.

There is almost no provision for the hospital treatment of whooping-cough in this country. New York, Philadelphia, New Orleans and Cincinnati are the only cities which have special wards for the treatment of whooping-cough. These wards are, however, small, and in general only the most severe cases and those with complications are admitted. Children with whooping-cough, if severely ill with complications, are sometimes admitted to other hospitals and isolated, but are more often refused admission, or turned out, if admitted by mistake.

There is no general rule as to the management of children with whooping-cough in out-patient and dispensary clinics. In most clinics, the children mix freely with the other children in the waiting-room at their first visit until they are discovered by the physician. In a few clinics, in which there is a physician to prevent children with contagious diseases from getting in to the general clinic, they are discovered at once. In the majority of clinics, children with whooping-cough are not allowed to return, but are referred to various charities or to their own physician. In others, they are treated at the beginning or the end of the clinic in separate rooms and immediately sent home. The isolation obtained in this way must necessarily be very incomplete and unsatisfactory. In some clinics no attempt is made to separate these children from the others, and they are allowed to return for treatment as often as they desire. It is hard to imagine any better method for the dissemination of the disease. In two or three clinics, however, they are treated at an entirely different hour from the other patients.

No further arguments are necessary to prove that more should be done to limit the spread of whooping-cough than is now being done, and that more strenuous efforts should be made to diminish the terrible mortality from this disease than are now being made. It is necessary, however, in order to take intelligent measures to limit the spread of this disease, to know first the nature of the contagion and when and how it is transmitted.

Mallory has proven conclusively that the Bordet-Gengou bacillus is the cause of whooping-cough. This organism is present in the sputum in the catarrhal stage and is most abundant at this time and in the first two or three weeks of the spasmodic stage. It has been found in the sputum, however, as late as the eighth week of the spasmodic stage. It is fair to assume, therefore, that the disease is transmitted by the secretions of the respiratory tract and that, while most contagious during the catarrhal and early weeks of the spasmodic stage, it is also contagious throughout the whole of the spasmodic stage. Kittens, puppies and monkeys may be infected with the disease. This probably happens so seldom under ordinary conditions, however, that infection from animals can for practical purposes be disregarded. The Bordet-Gengou bacillus is very easily destroyed outside of the body. Indirect contagion is, therefore, very unusual and of but little importance.

On account of the indefiniteness of the early symptoms and the frequency of mild types of whooping-cough, it is probable that almost everyone will, for the present at least, sooner or later contract it. While this is true, it is not so serious as at first appears, when it is remembered that about 95 per cent. of the deaths from whooping-cough occur during the first five years and the great majority of these in the first two years. The most important thing, then, is to keep babies and young children from having the disease.

The first step to be taken in the attempt to control whooping-cough and to diminish the death-rate from it is to convince physicians and the public in general of the seriousness of this disease in infants and young children and of the importance of protecting them from it. All regulations, no matter how well planned, will be useless until those interested in their enforcement are so convinced. They can be convinced only by a campaign of education. This campaign will have to be led by the pediatrists and United States Public Health authorities, since they are the only ones who at present seem to appreciate the importance of the subject. When the public and physicians are properly educated, regulation will be relatively simple.

Whooping-cough must be made everywhere a reportable disease and the same penalties imposed for failure to report it as in the case of other contagious diseases. The house should be placarded and the inmates instructed by health officers as to the seriousness of the disease in infancy and the methods to be employed to prevent contagion. The sputum and the vomitus should be treated in the same way as in pulmonary tuberculosis.

Children under five years of age should be separated from the patient. If such separation is impossible, the patient should be removed by the health authorities to special hospitals provided for the purpose. These hospitals should be constructed on the "shack" plan, in order to give the children the maximum amount of fresh air and in this way prevent the development of complications and cross infections. They should be so situated that the children can be up and out of doors in suitable weather. There is no reason why children that remain at home should be isolated in one room and not allowed to go out of doors, provided they are kept away from other children, if they do go out. They ought not to be allowed on the street, but, in order to protect other children in case they do get on the street, they should be required to wear an arm-band of some prescribed color and labelled "whooping-cough" in large letters. They should not be allowed, under any circumstances, to visit places of public congregation or to travel in public conveyances. Children who fail to observe the quarantine regulations should at once be sent to the hospital by the health authorities, no matter what their circumstances or social position. They should not be released from quarantine until after the cessation of the paroxysmal cough or until at least six weeks have elapsed since the onset, even if the paroxysmal cough has ceased. It is probable that in the future quarantine will be maintained until after the cessation of the paroxysmal cough and the disappearance of the Bordet-Gengou bacillus from the sputum.

The vitality of the Bordet-Gengou bacillus outside of the body being slight, formal disinfection is not necessary. Thorough cleaning and airing of the premises is all that is required.

The other children in the family should not be allowed to attend school unless they have already had the disease or until two weeks have elapsed since the last exposure, provided they are free from catarrhal symptoms. It is possible that this period of two weeks may be too short, the evidence as to the length of the incubation period of whooping-cough being unsatisfactory. Present observations seem to show, however, that it varies between two and ten days. Two weeks should, therefore, be amply sufficient.

Children with catarrhal symptoms, in whom there is any reason to suspect the possibility of whooping-cough, should be excluded from school. It is probable that in the future the examination of the sputum will be used as a test in the same way that the bacteriologic examination of the throat is now used when diphtheria is suspected. There is a leukocytosis with both an absolute and a relative lymphocytosis in both the catarrhal and paroxysmal stages of whooping-cough. This blood formula is of considerable assistance in diagnosis, but, owing to the facts that it is obscured if there are any complications and that it is not always present, it cannot be relied on implicitly. The community should be required to establish hospitals, not only to take care of those children that cannot be, or are not, properly isolated at home, but also to take care of those babies and children ill with the disease that cannot be properly treated in their homes.

It can be confidently predicted that, when the physicians and the public understand what whooping-cough really means, when proper rules for its control are established and enforced, and when sufficient hospital accommodations for its care are provided, whooping-cough will cease to be the scourge which it now is.

TUBERCULOSIS AS AN INFECTIVE DISEASE.—W. Cecil Bosanquet (*The Lancet*, January 31, 1914) concludes from his observations that infection with tuberculosis is very widespread and takes place largely in infancy and early childhood. It is partly due to bacilli derived from human sources, partly of bovine origin, but the former type greatly predominates. Direct communication from one human patient to a healthy individual does not occur in adult life under good sanitary conditions, with the possible exception of a few instances in which there has been very close and prolonged contact. Under bad hygienic conditions direct infection may occur, children being specially susceptible. The exact mode of transmission of the bacillus is unknown, but that inhalation affords the simplest explanation, although the localization of the chronic form of the disease in the lungs is not in itself evidence of direct implantation there. The chronic form of the disease met with in adults is due to their increased resistance. The outbreak of tuberculosis in later life may be due to reinfection from without or to recrudescence of a latent focus of old infection. A general rise in resistance has been brought about owing to the wide dissemination of the disease among European nations, and the fall in the death rate is largely due to this factor. One may further deduce the practical moral that the most hopeful measures which can be taken with a view of combating the disease are such as are directed toward improving the general wellbeing, and especially the housing conditions, of the poorer classes. —*Medical Record.*

THE TREATMENT OF PERTUSSIS.*

BY EDWIN E. GRAHAM, M.D.,
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The treatment of pertussis is one which has always absorbed a large degree of medical attention, and the mere enumeration of all the drugs, inhalations, and cures, which have from time to time been brought forward, would consume far more time than you have kindly allotted to me. I will not, therefore, attempt to mention all the drugs and plans of treatment that might properly be considered in a historical sketch of this common and much-to-be-dreaded disease, but will draw particular attention only to a few of the drugs and methods of treatment that have in my judgment stood the test of long experience, as fresh air, careful attention to feeding and digestion, local applications to the nasopharynx, inhalations, belladonna, antipyrin, bromides, codein, trional, heroin and chloral. Among the newer methods of treatment to which I wish to call your attention are: quinin given intravenously and intramuscularly, adrenalin, suggestion, and vaccine treatment.

As pertussis is contagious from the very beginning of the catarrhal stage until the end of the spasmodic stage—a period of about ten weeks—it is important that all children free from the disease be kept separated from any individual who has it, and in order for quarantine to be effective all unexposed children should, if possible, be sent away from the house during the entire period of contagion. This applies particularly to infants, in whom pertussis is associated with considerable danger; and all children who are not robust or who have a tendency to tuberculosis should be especially protected. A child with pertussis should not be allowed to attend school, and quarantine should be continued until the end of the spasmodic stage.

All children with pertussis should be given an abundance of fresh air and should be kept in bed if their temperature is 100°F. or higher. If the patient is sufficiently ill to be in bed the windows should be open day and night; if not in bed the child should spend as much time as possible out of doors. However, as excitement and violent exercise increase the tendency to attacks, an effort should be made to keep the child interested and amused with the minimum amount of exertion on his part. An acute laryngitis or rhinitis is, however, not benefited by cold air; for such cases the air in the sick-room must be kept fresh but not cold. Cold, fresh air is of benefit in all other pertussis cases. A change of air, especially to the seashore, is often of benefit, and a change from a raw, damp climate to a warmer and milder one is often followed by improvement.

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* Read, by invitation, before the New York Academy of Medicine, Section on Pediatrics, April 9, 1914.

If the child has been confined to bed any considerable time it is of advantage to remove him to another room and thoroughly house-clean the room before returning him to it. Wards where pertussis patients are treated should, if possible, be cleared of all patients and house-cleaned and fumigated before the patients return to them. Many cases of whooping-cough in a hospital ward suffer with mixed infections, and at least a temporary benefit will follow their removal to a recently cleaned and fumigated ward.

All children with pertussis should be fed in small quantities and often, and the younger the child the more necessary it is to preserve its strength by proper attention to its food and digestion. If a child vomits soon after receiving nourishment, it should be given another feeding to replace the one vomited. Gastrointestinal disorders in the young child suffering with pertussis often constitute a dangerous complication, and should receive early and careful dietetic and medicinal treatment.

Local applications to the nasopharynx, if made early in the disease—during the first two weeks—may be of decided value. They are of assistance only when the infection is localized in the upper air passages, as in rhinitis and pharyngitis. At this period an application of 2 per cent. nitrate of silver solution to the nasopharynx may, by producing death of the superficial mucous membrane, and, possibly, destroying some of the specific pertussis bacilli, tend to prevent the spread of the infection to the deeper respiratory passages.

Ochsenius, of Chemnitz[1] has recently reported 107 children treated by this method, with improvement in 84 of them. He makes the application every second day, and claims that eight days after the beginning of the treatment the number of paroxysms is slightly diminished and the severity of the attacks decidedly lessened, and by the third or fourth week the improvement is marked. He lays special stress on the importance of using the nitrate of silver solution early in the disease, when the infection is limited to the upper respiratory tract. Phenol (1 per cent.) has also been used successfully as a local application. It should be used early and may be repeated every second day.

Various drugs have been used by inhalation. Among those generally employed may be mentioned creosote and carbolic acid. They may be used in the ordinary inhaler covering the nose and mouth or the vapor may be employed in the room of the patient. They act as a sedative to the inflamed mucous membranes and at least in some degree as a local antiseptic. As children are especially susceptible to carbolic acid poisoning, the urine must be closely watched. Chloroform may also be given cautiously by the physician when the paroxysms are especially severe and frequent. When the spasm of the glottis is unusually severe, intubation may be done and often gives relief.

The medicinal treatment of pertussis may, for convenience, be divided into two parts: First, drugs or other methods that *per se* have a tendency to lessen the number and severity of the paroxysms. Second, drugs or other methods that are directed to the treatment of the complications of pertussis. To the first an unusual amount of attention has been given; to the second, comparatively little. Among the drugs that *per se* are useful in pertussis must first be mentioned belladonna. Personally, I prefer using the tincture, beginning with one drop, three times a day, and increasing the daily quantity by one or two drops until mild physiological effects of the drug appear, when the increasing of the dose must be cautiously continued.

Antipyrin is a useful drug, but I have never used it in the frequent doses so often advised. A single dose at bed-time, or a morning and evening dose has been, in my experience, as much as it was wise to employ. To a child of two years I would give 2 or 3 grains each night, or morning and night.

Bromid of soda, grains v, three or four times a day, to a child of three years, is often of benefit, and codein, trional, heroin, and chloral are often of benefit in allaying cough and inducing sleep. They may be given in a single dose at bed-time, or, if necessary, two or three times a day. A combination of quinin, two parts, veronal, one part, has been used successfully by Professor Winternitz, of Vienna. He claims distinct improvement in 26 out of 30 children in whom he used the combined drugs, but believes that it only acts as long as given and is not a cure. During its administration the paroxysms became milder and occurred less frequently; there was less vomiting and the appetite improved. Frankel and Hauptmann[2] also advise this combination of veronal and quinin. The dose ordinarily employed for a child of two years was veronal, ½ grain; quinin 1 grain, repeated three to four times a day, according to the effect produced. They do not advise its use in children under six months of age. Soolman and Hatcher[3] report favorable results from a combination of quinin, grains i-ii, and bromid, grains i-ii, repeated three or four times a day for a child two years of age.

Quinin has been used in large doses and when so given may reduce not only the number, but also the severity, of the paroxysms. It is not an antispasmodic, and if it produces any effect in these large doses, it must be due to some effect on the causal bacillus. Lenzmann[4] has reported some interesting results from the giving of quinin intravenously and hypodermically. He secured very prompt and positive results from doses of 5 grains injected intravenously every second day. He claims that all paroxysms rapidly disappear and that the treatment acts like a charm. Quinin lactate, 10 grams; saline solution, 100 grams, of which 2½ c.c., warm, is injected intravenously, may be similarly used. If given hypodermically into the muscles the effect is favorable, but not as prompt nor as satisfactory as when given intravenously.

Hydroquinin has been employed both intravenously and intramuscularly, but its action is more favorable when injected into the vein. It has been put up in ampules, the dose being in proportion to the age of the child. A daily dose is given for five or six days, then a dose every second day, and it is claimed that a marked improvement is noted after the first week of treatment. No disagreeable local or constitutional symptoms followed either the intravenous or muscular injections, and as so much is claimed for this treatment it is worthy of more extended trials. Hydroquinin has been used both intravenously and intramuscularly as a prophylactic with satisfactory results.

Adrenalin is strongly advised in the treatment of pertussis by Fletcher,[5] and since the publication of his article others have reported favorable results following its use. Wm. J. Lord,[6] where all other means failed, in a very delicate child, gave, by the mouth, 3 m. of a 1-1,000 adrenalin solution every four hours. The dose was soon reduced to three times a day, and the child rapidly improved; not only the number of the paroxysms became less, but their severity decidedly diminished. Carta Mulas[7] had also read

Fletcher's article and used adrenalin in a small epidemic of pertussis. He treated 15 cases, giving two to three drops of 1-1,000 adrenalin solution every two to three hours. The cough and vomiting rapidly diminished, no complications or bad effects followed the treatment, and in two or three weeks the patients were entirely well. He claims that the rapid cure of these cases prevented the spread of pertussis, as only 5 per cent. of the infants contracted it. In his opinion, adrenalin exerts a specific action on the causal agent of pertussis.

Every close student of pertussis must be impressed with the psychic element that so often enters into the disease, especially in neurotic children. If, as so often happens, the mother and those who are brought in contact with the nervous child are also neurotic, all the conditions are favorable for the development in this nervous child with pertussis, of marked psychic phenomena. Given a neurotic child where the psychic element is present, it is quite possible for suggestion to be advantageously used as an aid to the treatment. Oberholtzer,[8] in discussing the psychic element in pertussis, narrates the case of a boy seven years of age whose nurse, believing the paroxysms were largely induced by the desire of the boy to be carried in her arms, refused to carry him any more. His paroxysms ceased and he made a prompt recovery. His little sister of twenty months always began to cough as soon as the boy had a paroxysm. The nurse reproved her and the paroxysms of cough ceased. One day a trip on the lake was planned and after the nurse told the boy, when a paroxysm threatened, that they would have to return home, the cough disappeared for four hours.

Hamburger[9] also calls attention to this psychic element, and reports the case of a girl three and one-half years old cured by suggestion. The child suffered with pertussis for five weeks and was cured in two days by the faradic current. Hamburger infers that in this case the paroxysms were a pure neurosis after five weeks—what he calls a "half voluntary reflex."

The time allotted to me does not permit of my discussing the treatment of the complications of pertussis, but several cases that I have seen this winter deserve at least passing mention. A boy, thirteen months old, with a tuberculous family history and himself tuberculous, passed successfully through a severe case of pertussis complicated with bronchopneumonia. In the stage of decline he became more and more drowsy and a clear fluid was removed by lumbar puncture in which the tubercle bacillus could not be found, and a guinea pig injected with 3 c.c. of this fluid failed to develop tuberculosis. There had never been any discharge from either ear, but Dr. MacCuen Smith obtained a drop or two of fluid by swabbing the ear with cotton. Pus was obtained from both ears by puncturing the drums; the day following, a double mastoid operation disclosed a well advanced double mastoiditis with secondary otitic meningitis. The temperature had been normal for ten days before the operation. We all, of course, appreciate how latent a mastoiditis may be in a child, but with no local evidence of mastoid disease, no ear discharge and no fever, the condition is easily overlooked.

Another case of interest was the seven-year-old son of Dr. C., of Philadelphia, who during an attack of pertussis had an unusually severe paroxysm on February 15th. The next morning he had fever and vomiting. Vision continued to decline until March 13th, when vision is found to be: left, 11/200; right, 20/100. The discs are pale; retinal arteries reduced in size; field of view is concentrically contracted. Previous high grade double optic neuritis (choked disc). At present, total secondary atrophy. Disseminated choroiditis, both eyes. Divergence. Vision reduced to light perception. Pupils moderate in size and no reaction. Under ethyl-chloride narcosis, pupils contract *ad maximum*. Diagnosis: hemorrhage into the sheath of nerve at the optic chiasm. These 2 cases illustrate the necessity of a correct diagnosis of complications in order to properly carry out appropriate treatment.

I am quite sure that you all expect me to say something about the vaccine treatment of pertussis. I was the first to try this method of treatment and have carefully read the reports of all cases treated by this method since the publication of my paper in January, 1912. A large number of articles have appeared upon vaccine treatment, and from the close study of my own series, as well as many cases seen in consultation where the vaccine treatment has been used, since the publication of my paper, has convinced me that it is a distinct addition to our treatment, and is also of more or less use as a prophylactic. In a case of moderate severity in either an infant or an older child, when the number of the paroxysms is small and of a mild character, the vaccine treatment is not necessary, but it is often of distinct benefit, in the severe cases, in children of all ages, and its influence as a prophylactic, especially where infants have been exposed, or where a frail or possibly tuberculous child has been infected with the pertussis bacillus, should be carefully worked out, and its prophylactic power tested by its use, in a large number of cases. The papers on vaccine treatment by American and foreign authors are too many to quote at length, but a few will be mentioned.

E. M. Sill[10] reports 33 cases treated with vaccine. In all the number and severity of the attacks were markedly diminished. He advises 50,000,000 every second day in moderately severe cases and 100,000,000 in very severe cases. He reports 13 additional cases and 3 prophylactic cases which were exposed and proved to be immune. All 16 cases were treated with pertussis vaccine, 50,000,000; staphylococcus aureus, 20,000,000; micrococcus catarrhalis, 20,000,000. With best drug treatment the cough persisted from seven to twelve weeks; with pertussis vaccine from four to four and a half weeks, and with combined vaccine from three to three and one-half weeks. Of the last 10 treated with combined vaccine, all were cured in three and a half weeks.

There seems to be a growing tendency to treat pertussis with a mixed vaccine. Sill cites Dr. Freeman, of London, who treated 1,140 cases with vaccine with the following results: Much better, vaccine, 31 per cent.; control saline, 21 per cent. Better, 37.1 per cent.; control saline, 34.5 per cent. Unchanged, 15 per cent.; control saline, 23.9 per cent. Worse, 15.2 per cent.; control saline, 18.15 per cent. Much worse, 1 per cent.; control saline, 1.85 per cent.

Sill believes that no bad effects follow the vaccine treatment; that the average length of the cough under this treatment is about four and one-half weeks. He suggests giving the vaccine treatment every day for a few days in very severe cases and he is guided more by the severity of the disease than the age of the child. The cases seen earlier in the disease before the height of the paroxysms is reached, respond most quickly to treatment. The younger child receives relatively larger doses, and responds more quickly to treatment. He considers this important because of the grave danger of pneumonia developing in the young child. He also believes that vaccine may confer immunity.

Chas. Nicolle and A. Conor[11] used living cultures of the Bordet bacillus, injected under the skin, repeated every two or three days. The treatment was given to 122 children, but 18 were not seen after the first injection. Of the 104 that were treated, 37 were cured, 40 improved, and 27 remained stationary. In the cases cured the improvement was manifest early. The improvement was noticed after the first or second injection, the number and severity of the paroxysms being diminished.

Lagane[12] claims that the endotoxin of Bordet bacillus is irritant, and even necrotic, to the mucous membrane and may cause a necrosis. The immunity lasts long and, therefore, the best results from vaccine ought to be in prophylaxis.

Professor Manicatide[13] finds the Z bacillus in all stages of the disease. He made a vaccine with this Z bacillus and treated 300 children with very good success. As a prophylactic he vaccinated 15 cases, none of whom contracted the disease; of 15 controls, all contracted it.

Yakowleff[14] has employed vaccination for small-pox in cases of pertussis.

Many other papers, almost all of them favorable to the treatment, might be mentioned. In view of all this evidence, most of it favorable, it seems to me advisable to use the combined vaccines in the treatment of severe cases of pertussis. The final verdict as to its efficiency can only be decided by additional evidence.

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VACCINE TREATMENT IN PERTUSSIS.

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The treatment of pertussis with vaccine is still in an experimental stage. This is due, in the first place, to our lack of definite knowledge regarding the bacteriology of pertussis, and, in the second place, to the comparatively small amount of reliable data upon which to base conclusions regarding the proper dosage of the vaccine and the best mode of its administration, *i.e.,* how often and how much.

Although the Bordet-Gengou bacillus is generally regarded as the most important etiological factor in this disease, yet, according to Williams,[1] we cannot accept it as the proven specific cause. Not only the Bordet-Gengou bacillus, but many organisms of the hemoglobinophilic group of bacilli are also found in the cases observed; no specific lesion has been demonstrated in man or in animals which can be considered characteristic, and, in addition neither the agglutination nor the complement deviation tests are dependable (Wollstein[2]). Accordingly, the preparation of a suitable vaccine must be determined by the bacteriology of each case. It is on this account that better results should be expected from the use of an autogenous rather than a commercial vaccine. The difficulty in obtaining an autogenous vaccine in cases of pertussis is responsible for the production of a variety of stock preparations, some of them consisting of pure cultures of the Bordet-Gengou bacillus, others being a combination of Bordet-Gengou, staphylococci, micrococci catarrhalis and of the influenza bacillus. The use of a combined vaccine of this type may be justifiable in that no harmful effects have been observed and that a certain number of cases are reported as responding favorably, but it can hardly be considered a logical treatment. It is more of the hit or miss order.

The need of a successful treatment for pertussis is unquestionably so great that no therapeutic measure should be disregarded until after a thorough trial it proves of little or no value. Experience only can determine this. Accordingly, a review of the work done with the various pertussis vaccines is of interest and of much importance.

The cases reported in medical literature up to the present time are as follows:—

Zahorsky, October, 1909.[3] Forty cases commercial vaccine, 10,000,000 to 20,000,000 every three days, 20,000,000 to 100,000,000 in older and severer cases every fifth day.

Conclusions.—One quarter of all cases no effect observed in the beginning or at the height of the disease. Temporary improvement appears at first which does not occur after repeated doses. Best effect obtained when disease is at its height. Has doubtful value in preventing disease.

Complicated Cases.—Effect uncertain, vaccine may do harm. One fatal case reported out of three.

Final Conclusion.—Pertussis bacterin in doses of 30,000,000 to 50,000,000 is a very helpful therapeutic resource. It should be given hypodermically every three or four days in infants from the beginning; in older children at the height of the disease. It is questionable whether it hastens permanent immunity.

J. Freeman, October, 1909 (London).[4] One thousand test inoculations with a Bordet-Gengou strain.

Class	Vaccine cases	Control cases
Much better	31	21.55
Better	37.1	34.55
Worse	15.7	23.9
Much worse	1	1.85

Conclusions.—Close observation for a long time required. Control and observation by another person necessary. Trustworthy serum reaction not yet obtained.

Kerley,[5] 1913, says that Freeman, in a personal communication, states that he has treated, and has records of, 1,140 cases. He used a control of saline. He believes that the cases did somewhat better. In a considerable number of cases a pneumococcus vaccine was given with the pertussis vaccine. These cases he thought did better than the saline control. He expresses doubt whether one should strongly advocate this line of treatment. Routine treatment was 250,000,000 Bordet and 10,000,000 pneumococcus weekly. Very young children receive 50,000,000 Bordet and 2,000,000 pneumococcus. He feels that the inoculations give the children a better chance and used it in his own family. Has observed no unfavorable after effects.

Graham, January, 1912.[6] Twenty-four cases—17 cases benefited, 7 cases not benefited. Injections of 20,000,000 Bordet-Gengou given every fourth day at first, then every third day, then every second day for a course of from six to eight treatments. Concludes that the dose should be larger—60,000,000, 80,00,000 or 100,000,000, especially for severe cases. The severity of the disease relieved, its course not greatly shortened. Worthy of a more extensive trial.

Ladd, August, 1912.[7] A specially prepared vaccine; dosage, 20,000,000 every five days.

Nine cases		Ages	Duration before treatment	After treatment	No. injections
150,000,000	1	9 months	8 weeks	8 weeks	6
170,000,000	2	9 “	3 “	6 “	8
120,000,000	3	6 years	2 “	4 “	4
100,000,000	4	2 “	3 “	3 “	3
100,000,000	5	3½-2 “	3 “	2 “	3
100,000,000	6	5 “	1 “	4 “	4
120,000,000	7	2½ “	3 “	5 “	6
80,000,000	8	16 months	Incomplete		2
37,000,000	9	7 weeks		3½ “	3

Conclusions.—Worthy of trial, larger doses, more frequent intervals.

Bacher and Menschikoff, February, 1912.[8] Treated a series of 24 cases with a vaccine from the original strains of Bordet bacillus. Initial dose ranged from 5,000,000 to 20,000,000, and subsequent doses, given at intervals of from four to seven days, increased to 200,000,000. One-half of their cases were not at all affected, while the improvement in the remainder could not be ascribed to the effects of the vaccine.

Saunders, Johnson, White, Zahorsky, March, 1912.[9] Forty cases treated, 14 immunized. Began with 5,000,000. Afterward gave 25,000,000. Of the cases immunized, 1 developed pertussis, which lasted for one week; 7 developed a mild cough lasting for one week.

Conclusions.—The vaccine is of high value as a prophylactic agent, although there is uncertainty as to the length of the immunity. As a remedial agent it should be administered promptly. Reports are favorable in nearly all cases. In no case should other treatment be withheld if indicated, especially in infants. In late cases larger doses may give better results. Systematic efforts should be made to determine the duration of the artificial immunity.

Bamberger, January, 1913.[10] Commercial vaccine, Bordet-Gengou. Reports 6 cases given 20,000,000 every alternate day.

	No. injections	Duration after treatment	Total duration
Case 1	5	13 days	30 days
" 2	9	18 "	42 "
" 3	7	16 "	30 "
" 4	8	18 "	28 "
" 5	15	30 "	41 "
" 6	8	22 "	32 "

Conclusions.—Lessens severity. Abort complications rather than shorten duration. Sooner begun the better the result. Larger total dosage, 500,000,000, more frequent, as every day. Apparently harmless.

Wilson, April, 1913.[11] Forty million every forty-eight hours, according to reaction; may be doubled or tripled. Twenty-four cases. Duration: Longest, forty-eight days; shortest, nine days; average, twenty-three days.

Conclusions.—A bacterin from the Bordet bacillus rapidly controls the "kink." Improvement proportional to the systemic reaction. When this is poor there is need of stimulating drugs. The specific element appears to vanish with the "kink."

Sill, May, 1913.[12] Commercial vaccine, 33 cases. Doses from 20,000,000 to 60,000,000 at intervals of from one to three days.

Averages.—Number of treatments, 7; amount, 28,000,000; duration, four weeks.

Of 33 cases, 23 extended over six weeks' total duration. Of these 23, 16 extended over eight weeks.

Conclusions.—Diminishes vomiting, number and severity of paroxysms. Advocates larger doses—40,000,000 to 100,000,000 every alternate day. Earlier the treatment the better the result.

(NOTE: It is unfortunate that in many of these cases, as in other cases reported, the treatment was begun in the third or fourth week of the disease.)

Sill, June, 1913.[13] Reports 13 more cases, making a total of 46 cases of pertussis treated with vaccine. In this last series he used a combined vaccine, giving 20,000,000 to 60,000,000 at intervals of from one to seven days. Three cases apparently successfully immunized—one with four doses of 20,000,000 each at weekly intervals, another with nine doses of 20,000,000 during a month, and a third with three doses, 25,000,000, 50,000,000 and 75,000,000 respectively.

The average duration of the disease in this last series was six and one-half weeks. Six of the cases lasted for seven weeks and over.

Conclusions.—Respond quicker when seen earlier. After one to three injections the number and the severity of the paroxysms lessened. Best treatment at hand; relieves the symptoms and prevents complications. Younger the child the quicker the response.

Scott, January, 1913.[14] Seventeen cases; three of them not cured, but benefited. Commercial vaccine. Dosage.—At first gave 10,000,000 to infants, 20,000,000 to children at intervals of twice a week, or three times a week in severe cases. Now gives 40,000,000 to start with and another in proportion to the effects of the last dose. If much benefit, he prolongs intervals; if slight, he shortens intervals. He believes a dose of 40,000,000 at shorter periods to be better than a larger single dose.

Conclusions.—Number of attacks less, severity diminished, cyanosis less marked, vomiting disappeared, children slept better. No reaction from the vaccine. Buttocks the best site for injection.

Davidson, October, 1913.[15] Seventy cases. Commercial vaccine, 20,000,000 per c.c.; 6,000,000 to 10,000,000 for initial dose in infants; fourth day, 12,000,000 to 20,000,000. Gives mixed vaccine in the later stages.

Conclusions.—Good results; some brilliant. In discussion, South reports using a mixed vaccine influenza, streptococcus, staphylococcus aureus and albus pneumococcus. Begins with 200,000,000 in severe cases. Results not given. Barbour gives 50,000,000 every fourth or fifth day. Has used vaccine for two years with some good results; others negative, due to lack of knowledge of the bacteriology of those cases.

Nicolle and Conor, November, 1913.[16] Inoculations with living cultures of Bordet bacteria. Cultures made into an emulsion, each drop containing 400,000,000 diluted with 2 c.c. of physiological salt solution. One to five drops of this emulsion injected under the skin of thigh every second or third day.

Of 104 cases, 37, or 35.37 per cent., cured three to twelve days; 40, or 38.46 per cent., improved; 27, or 25.96 per cent., stationary.

Luttinger, December, 1913.[17] Commercial vaccine, 20,000,000 to 40,000,000 every fourth to seventh day, results indifferent. Reports 10 cases treated with larger doses at shorter intervals. One case prophylactic.

	Total duration in days	Duration after treatment	No. injections	Total dosage	Maximum dosage
1	23	14 days	4	350,000,000	1,125,000,000
2	28	14 “	3	300,000,000	150,000,000
3	37	16 “	6	750,000,000	175,000,000
4	16	12 “	2	150,000,000	170,000,000
5	34	12 “	1	200,000,000	200,000,000
6	27	13 “	4	500,000,000	200,000,000
7	27	13 “	4	500,000,000	200,000,000
8	18	16 “	4	500,000,000	200,000,000
9	43	15 “	6	750,000,000	250,000,000
10	22	8 “	3	350,000,000	200,000,000

Conclusions.—Pertussis vaccine used in 10 cases apparently reduced the severity and shortened the duration of the disease. It should be given in larger doses and at shorter intervals than hitherto recommended. A dose of 50,000,000 should be tested as a prophylactic.

It is obviously absurd to draw conclusions from incomplete records, and, unfortunately, most of those obtained in the average out-patient department are of this class. When it is possible to have the cases outside observed by a visiting nurse, as should be done in all well-organized clinics, this element of unreliability is considerably diminished.

In a disease such as pertussis, in which an improvement in the patient's condition is so evident, the observations of the family are of significance. In several of our cases we had no other way of determining the general effects of the vaccine treatment between the dates of its administration. Again it must be remembered that the epidemics of pertussis vary so much in their severity and that children react so differently to an infection of this nature that only the consideration of a large number of cases subjected to a definite treatment is of value. It is on this account that we wish to add the following cases treated with vaccine to the lists of those already reported.

During the spring and summer of 1913 in the Roosevelt Dispensary and in private practice, we treated 18 cases of pertussis with a commercial vaccine made from a pure culture of the Bordet-Gengou bacillus. Twenty-five million was regularly given at the first treatment, except in very young babies, and 50,000,000 subsequently. The vaccine was administered once a week. Injections given in the buttocks or in the arms apparently caused the children no discomfort. The cases regarded as cured were those in which the number and the severity of the paroxysms was diminished after two or three injections, and the entire course of the disease was not over six weeks. In some cases the vaccine used contained appropriate strains and two of them in particular required only one treatment.

The importance of those cases which failed to respond favorably to this vaccine must not be overlooked in a report of this work. We found 6 cases which were unimproved. One, a physician's child, received two treatments of 25,000,000 each. For thirty-six hours following these injections both the frequency and the severity of the paroxysms increased to such an extent that the father objected to a continuance of the vaccine.

Another case, Pl., was greatly helped by an initial dose of 12,000,000, but failed to show any improvement after a second of 30,000,000. After a third injection of 12,000,000 the mother discontinued the treatments.

Case W., a baby of eight months, was, according to the parents, so greatly prostrated after an initial dose of 12,000,000 that they refused to allow further injections. When seen the child's condition was not worse than would be expected with a severe infection. Its recovery was uneventful under medical treatment.

Case C. was treated ten weeks with vaccines without showing satisfactory improvement. Doubtless doses larger than 50,000,000 at more frequent intervals were indicated. Her total dosage amounted to only 350,000,000.

While the vaccine was being used and subsequently, 9 cases of pertussis were treated with antipyrin and sodium bromid mixture, and with the oil of thyme preparations. The average duration of the attack in these cases was seven weeks; the longest was twelve and the shortest was four weeks.

Name	Treatment	Course	Results
S. T.	Ol. thyme	4 weeks	Immediate improvement
J. F.	Antipyrin and bromid mixture	6 “	Gradual improvement
H. K.	“ “ “ “	7	“ “
T. C.	“ “ “ “	8	“ “
F. C.	“ “ “ “	7 “	Slight cough when last seen
H. S.	“ “ “ “	6 “	Practically well
H. P.	“ “ “ “	8 “	Still coughs occasionally
R.	Ol. thyme	6 “	Gradual improvement
M.	“ “	12 “	Paroxysms relieved

Some of these cases responded very quickly to this treatment. Compared with those cases which were benefited by the vaccine the average course was longer and the improvement in the symptoms was slower.

Blood examinations were made in 18 cases in the catarrhal or paroxysmal stage. Most of these showed a considerable increase in the percentage of lymphocytes which is regularly expected to accompany pertussis and, according to Kolmer, Mosenthal and others, is of important diagnostic value in the early stages of this disease. It will be noticed, from the results of blood examinations in normal children, that during the first two years of childhood the percentage of lymphocytes is relatively high—50 per cent. or more—but from this age on there is marked decrease in the percentage. This must be carefully borne in mind when a blood count is being made for diagnostic purposes.

In three of our cases the diagnosis of pertussis was made ten days before the characteristic whoop developed. These were children from three to five years of age and their lymphocytes amounted to 63 per cent., 58 per cent. and 57 per cent. Their total leukocyte count was low—6,000, 10,000 and 14,000. Previously the parents had been assured that the children were suffering from simple colds.

Our total leukocyte counts are lower than those generally reported.

Name	Age	Leukocytes	Lymphocytes	Poly.	Eosin.	Transitionals
R.	5 years	12,600	65.6	30	3	1.4
S. T.	5 “	6,000	57	40	3	
D.	3 “	37,000	75	23	2	Advanced case
D. A.	4 “	9,000	57	41	2	

Name	Age	Leukocytes	Lymphocytes	Poly.	Eosin.	Transitionals
*S.	4 “	8,000	33	64	1	2
*H. M.	9 months	8,000	55	43	2	
B.	1 year	10,000	54	36		
S. B.	2 years	10,000	41	56	3	
G.	3 “	12,000	58	40	2	
B. S.	3 “	5,000	62	34	3	1
E. G.	8 “	16,000	61	38	1	
*E. G.	6 “	13,000	55	45		
F. C.	5 “	10,400	58	40	2	
*P. L.	6 “	10,000	70	30		Advanced case
D. E.	3 “	14,000	51	49		
B. A. R.	6 “		59	38	3	
E. D.	6 “	13,000	60	40		
J.	6 “	12,000	44	54	2	
18 cases	4 “	12,111	56.3	40.3	2	1.4

Blood count in normal children (Schloss[18]) :—

Age	Poly.	Lymphocytes	Large Mononuclear	Eosin.	Mast.
2-4 weeks	29.2	55.6	9.7	4.5	.4
1-2 months	29.7	51.3	11.7	6	.4
2-6 “	25.9	60	10.9	2.5	.3
6-12 “	30.4	55.9	9.6	2.6	.4
1-2 years	36.3	51.2	8.5	3.2	.2
2-3 “	38.7	49	8.2	3.1	.4
3-4 “	44.7	39.1	11.2	2.8	.5
4-5 “	48.5	42.1	6	2.6	.3
5-6 “	56.6	29.9	10	2.5	.6

Blood count in normal children (Mosenthal[19]). 22 cases :—

Age	Poly.	Lymphocytes	Eosin.
1-2 years	30.4	68.1	1.2
2-3 “	42.7	55.6	1.3
3-4 “	48.7	48.1	2.8
4-5 “	40.3	53.2	4.7
5-6 “	48	45.7	5.8
6-7 “	49.4	46.5	3.7
7-8 “	49.2	46.8	3.5

* Received vaccine treatment.

Blood count in normal children (Kolmer[20]):—

Age	Poly.	Leukocytes	Lymphocytes	Transitionals	Eosin.	Mast.
3-12 months	36.7	10.900	58.5	2.2	2.13	.07
1-2 years	42.6	11,600	55.3	1.5	1.45	.03
2-3 "	49.8	12,300	46.2	1.15	2.3	.01
3-5 "	59.3	10,800	36.6	.7	2.73	.15

Kolmer[21] gives the following summary of blood examination in pertussis:—

Stage.	Cases.	Age.	Leukocytes.	L.	S.	Transit.	Poly.	Eosin.	Mast.
				Lymphocytes					
Precatarrhal	2	4 mos. to 5 yrs.	14,800	44,01	5.23	1.72	39.57	9.31	.14
Catarrhal	27	5 " " 5 "	16,800	49.19	9.83	2.03	34.98	3.35	.53
Paroxysmal	27		22,000	63,19	8.19	1.77	23.92	2.35	.53
Marked Impr.	27	10 " " 4 "	16,800	38.39	10.6	1.34	45.09	3.71	.55

Ladd[7] reports that the blood in 8 cases of pertussis showed:—

		L.	P.	E.	Mast.
9 months	31,600	53	47		
2½ years	35,000	55	40	3	2
6 "	14,000	45	55		
2 "	7,000	65	34		1
3½ "	15,000	60	40		
5 "	17,200	58	41	1	
9 months	41,200	83.5	16	.5	
9 "	15,000	64	34	2	

Mosenthal[19] reports the blood findings in 19 cases of pertussis:—

CATARRHAL STAGE.

Under 1 year	3 cases	25,800	74.9	P.24
1-2 years	2 "	41,450	71.1	27.9
2-3 "	7 "	24,114	62.4	34.4
3-4 "				
4-5 "		14,300	61.6	37

CONVULSIVE STAGE.

Under 1 year	4 cases	47,650	78.7	19.7
1-2 years				
2-3 "	13 cases	17,430	65.1	40
3-4 "	4 "	15,380	60	38
4-5 "		28,400	52.3	36.8

During the catarrhal stage in pertussis there is an increase in the leukocytes approximately double the normal. Mononuclear increased about 5.5 per cent. at expense of the polymorphonuclear cells.

In Case D. A., which did not subsequently develop pertussis, an incorrect positive diagnosis was made from a lymphocytosis of 57 per cent., and in Case S. an incorrect negative diagnosis was made from a lymphocytosis of only 33 per cent. They were both children over five years of age.

We are now co-operating with the Research Laboratory of the Board of Health in the continuance of this work. Working with a polyvalent Bordet-Gengou vaccine from the laboratory, our plan is to start with a dose of 50,000,000 and to double this dosage every third or fourth day, if advisable, up to 400,000,000. If there is no satisfactory response after four treatments the vaccine is discontinued. We are also trying to immunize exposed cases by three treatments at weekly intervals. The first consists of 50,000,000, the second of 300,000,000 and the third of 500,000,000. So far we have had very little experience with this branch of the work.

CONCLUSIONS.

From the literature reviewed it seems fair to draw the following conclusions. 1,445 cases observed and reported:—

(1) There is not an universal endorsement of pertussis vaccine.

(2) A variety of vaccines are being used without definite knowledge of the bacteriology of the individual cases treated.

(3) There is a striking lack of negative reports.

(4) Apparently the vaccine is harmless in uncomplicated cases.

(5) There has been established no definite standard for dosage or for treatment.

(6) The dosage generally used has been apparently too small.

(7) The course of the disease in the majority of cases reported has not been much under six weeks.

(8) Its value as a prophylactic agent is still undetermined.

(9) It is generally conceded that the earlier the treatment is given the better the result.

	Name	Age	Month	Duration before Vaccine	PAROXYSMS		VOMITING		VACCINE			Duration of Treatment	RESULTS			REMARKS
					Day	Night	Day	Night	No.	Dosage	Total		Paroxysms	Vomiting	Course	
CURED	E. B.	2 years	May	2 weeks	5–6	2–3	3–4	3–4	2	50 mil. 25 mil.	75 mil.	19 days			5 weeks	Under treatment 19 days. After second treatment no paroxysms at night. Occasional vomiting
	J. C.	7 years	April 1 May	3 weeks	8–10	10–15	Occasional		1	50 mil.	50 mil.	No subsequent treatments			4 weeks	Improvement at once. Did not return. Had medical treatment before
	J. M.	6½ years	May	2 weeks		8–9	Occasional	Occasional	4	50 mil.	200 mil.	21 days			5 weeks	Worse after 2 treatments. Then improved
	H. M.	9 months	May	2 weeks	Every hour	Every hour	None	None	4	Three of 50 mil. One of 25 mil.	175 mil.	1 month			6 weeks	Worse for 2 nights after treatment. Then improved greatly and recovered
	E. G.	9 years	May	2 weeks		10	Occasional	Occasional	2	12½ mil. 25 mil.	37½ mil.	1 week			3 weeks	Improvement was immediate
	E. C.	10 years	May	2 weeks	3	2	3	2	1	50 mil.	50 mil.	1 week			3 weeks	So much improved did not return
IMPROVED	J. B.	6½ years	May	2 weeks	6–8	8–9	Occasional	Occasional	4	50 mil.	200 mil.	4 weeks			6 weeks	After three doses cough and vomiting less
	W. D.	5½ years	May	10 days		12–20	Twice	Twice		25 mil. 25 mil. 50 mil.	100 mil.	2 weeks			4 weeks	Improved, mother did not wish treatment continued
	P.	6½ years	June	2 weeks	5	12	Occasional	Occasional	4	50 mil. each	200 mil.	20 days			6 weeks	Coughing was much less at night
	O.' B.	3½ mos.	June	4 weeks	8	12	Occasional	Occasional	3	50 mil.	150 mil.	10 days			5½ weeks	Attacks less severe, child taken to country
	O. B. E.	4½ years	June	10 days	8	7	Occasional	Occasional	2	50 mil.	100 mil.	20 days			5 weeks	Child taken to country, improved
UNIMPROVED	P. L.	5 years	May	2 weeks	12	10–12	10	12	3	12. 5 mil. 25 12. 5	50					Better after first, apparently worse after other injections. Treatments discontinued
	G.	4½ years	May	2 weeks	4–5	3	Occasional	Occasional	2	25. 0 25	50					Worse after treatments. Discontinued
	W.	8 months	July	2 weeks	3–4	5–6	"	"	1	25	25					Mother thought child would die after first treatment
	O. F.	3 months	July	3 weeks	6–8	8–10	"	"	2	25	50					Mother would not allow treatment continued
	C.	2 years	May	2 weeks	10–12	2–3	4–5	4–5	7	25 (1) 50 (5) 75 (1)	350					Lasted 12 weeks, improvement slight
	V. E.	3½ years	May	2 weeks	1–2	2	Occasional	Occasional	1	50	50					Developed Broncho-Pneumonia, died

(10) The vaccine treatment is worthy of a more extensive trial.

Conclusions drawn from the treatment with vaccine of 18 of our cases of pertussis:—

(1) A certain number of cases will respond favorably to a commercial vaccine.

(2) Where a commercial vaccine has not proved successful it would seem desirable to try an autogenous vaccine.

(3) The initial dose should be at least 50,000,000 in older children, and this may be doubled at subsequent treatments up to 400,000,000 at five-day intervals. Further observations regarding dosage indispensable.

(4) A certain number of cases will not respond favorably to a vaccine, and in those it should not be continued after a trial of four doses.

(5) The relative value of the combined vaccine as compared to the single culture vaccine is undetermined.

(6) In that the improvement in a few cases was immediate and striking, it seems fair to suggest, but not to recommend, its use.

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THE USE OF BLOOD SERUM OF IMMUNES IN THE TREATMENT OF MALIGNANT SCARLATINA.*

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That the vaccines, bacterins and serums are agents that have accomplished considerable, and are sure to accomplish much more, in the removal and cure of infectious diseases is a fact not to be denied; that their recent introduction and exploitation by the score has confusedly complicated the therapeutics of the last year or two and that the real intimate action and clear indication for the employment of most of them is not understood by either the expert or the ordinary internist, are also facts not to be denied. I doubt not that the really effective animal-derived products (not counting what might be called the normal derivatives, such as adrenalin, pituitrin, thyroidin, crotalin, etc.) the positive demonstrated products of the vaccine-bacterin-serum class, might be numbered on the fingers of one hand. There is diphtheria antitoxin, for curative and immunizing treatment; tetanus antitoxin for immunizing; and typhoid bacterin for immunizing—all positively established as efficient agents by overwhelming demonstration. Then come a more numerous list of partly proven products. And then a long list of similar medicaments whose value at present is, to say the least, quite uncertain, quite problematical, and, accordingly, quite disappointing in their employment.

Vaughan presents a very instructive paper, "Phenomena of Infection" (*Journal of American Medical Association*, February 21, 1914), setting forth the result of much original research in the field of biochemistry. After referring to the indubitable triumph of diphtheria antitoxin and hinting at the real value of a very few other such preparations, he gives the following warning: "But much of the protein therapy now so largely employed is without scientific justification. I have tried earnestly to so disrupt the protein molecules of certain pathogenic bacteria as to obtain a non-poisonous, sensitizing group which might be of value in either prophylactic or curative treatment, but without practical success. I have obtained from the cellular substances of the colon, typhoid and tubercle bacilli non-poisonous sensitizing proteins. Those from the colon and typhoid give some degree of immunity to subsequent inoculation with respect to living cultures, but the protection thus secured is low in degree and ephemeral, while that from the tubercle bacillus fails to protect experimental animals. I must therefore report failure, with glimpses of that will-o'-the-wisp which haunts the laboratory of every investigator."

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* Read before the St. Louis Medical Society, May 9, 1914.

Not that we should rest satisfied with the so-far limited use of this most promising class of medicaments, for we are ever advancing steadily toward the positive and practical, and must ever do so.

It is in view of these facts, declaring as they do that in the present unfinished state of our therapeutic armamentarium, most of our infectious diseases are not yet amenable to serum treatment—notably among them scarlatina—that I here offer in all seriousness such a treatment for malignant scarlatina as serum from the blood of scarlatina immunes.

Just in proportion as the medical man feels the positive satisfaction of having at hand so potent a remedy in diphtheria as the diphtheria antitoxin, or so trustworthy a preventive in possible tetanus as the tetanus antitoxin, just so much is his dissatisfaction, his sense of helplessness, with no specific yet at hand, when called upon to treat the malignant form of scarlatina. It is for this reason, and in the hope that something in what is offered may suggest to, or confirm in, the minds of others a line of treatment which may at least in part tend to bring our treatment of severe scarlatina up somewhere nearer in efficiency to our treatment of diphtheria, that I here present a blood treatment, a serum treatment for scarlatina.

The crudeness of my method, the absence of exact laboratory measurements and many other things which may offend the nice scientific sense of the advanced laboratory worker of today, I fully recognize, but do not apologize for, as what I offer is but an excerpt from the daily routine records of a practitioner of medicine. Does this branch of our calling receive in these later days the rating it should? Its membership is depleted every day as the result of the tendency on all hands to specialize, often with excellent results, but also not a few times both with loss to the ranks of the family-doctor and with questionable gain to the specialty adopted. This somewhat neglected specialty, shall I call it, of the general practitioner or the family-doctor, requires a breadth of understanding, an energy, a resourcefulness, a self-denial, alongside of which our more famous, our far more widely albeit legitimately advertised branches, can but suffer in a fair comparison!

I recall how, about the time of the introduction of diphtheria serum as a remedial agent, I had planned for the use of human blood-serum, taken from an immune subject for the treatment of severe scarlatina. Then with the wonderful efficiency of diphtheria serum demonstrating itself, we all looked forward to an early laboratory product which would prove equally efficient in the treatment of that other twin destroyer, scarlatina. Thus far we have waited only to be disappointed. Serums obtained from the manipulations of cultures of the streptococcus have been used with little or no real benefit. When I make this statement I refer to direct medication of scarlatina itself, and perhaps should modify it somewhat. The use of an homologous strain of galactose-killed streptococci has been fairly well demonstrated as efficient in scarlatina cases where the secondary infection by streptococci has become subacute or chronic. Here injections of gradually increased strength have given results which recommend their employment.

The following records are taken from my case book. They are given with some detail for a purpose made clear further on:—

Case I. Ruth L., *aet* five and three-quarter years, was attacked between February 4 and 5, 1911. She was seen the next day. The diagnosis of scarlatina was clear and the severity of throat and nasal involvement presaged a severe form of the disease. In the sthenic stage of infectious disease, with the rapid accumulation of toxins in the system, I have frequently used pilocarpin to stimulate excretion. The amelioration from this drug was slight, if any, in this case. The rash and throat exhibit became positively characteristic and, in spite of local antiseptic and the customary systemic treatment, the case became more and more grave. By the sixth day of the disease (February 11th) the following picture of malignant scarlatina was presented: Fauces deeply invaded with disintegrating tissue, the stench from this pervading two rooms, extending into the hall to the front door; bloody pus flowed from both nares; all contour of the neck was lost by bulging glands, the swelling extending over the face so that one eye could not be opened; temperature was high, lying between 104° and 105° F.; coma was profound, so that serum injections which were undertaken produced no movement of sensibility of pain. This was the condition when blood serum was used from the child's mother, whom I had attended in severe scarlatina six and one-half years before. At 10:30 P.M. (February 10th) about 1¾ ounces of blood was extracted from the mother's arm. Allowing this to stand, after sterilizing with a little boric acid, we were able to secure next morning 1½ drams of supernatant serum, which was injected hypodermically in the child at 10:40 A.M. (February 11th). This injection of serum was repeated evening and morning until four injections, each between 1½ and 2 drams, were given. The condition of the patient at the time of the first blood serum injection was at its worst—in fact it would have been hard to conceive of how it could have been worse. For twelve hours thereafter no change could be noted. Then it first became evident that not only was the case not retrograding, but slightly ameliorating. The cold baths were followed by not so rapid and marked return of hyperpyrexia, dyspnea was less agonizing, the reflexes formerly abolished began to assert themselves and coma grew less profound. This improvement by twenty-four hours after the first injection was very manifest and continued progressively to convalescence. What was worth noting also in the case was the fact that aural and cervical sequelæ were absent, although both adenitis and otitis of no mild type had been present.

Case II. Freddie P., *aet* two and one-third years, was attacked between February 19 and 20, 1912. The diagnosis of scarlet fever was evident from the first examination, February 20th. Pilocarpin to stimulate excretion was used at once and antiseptic applications made in nose and throat, with fever and nervous disturbances treated by cold baths—the gravity of this case was made plain by the fourth day of the disease—considerable prostration coming on, with high fever (104°), putrifying tissue in fauces and nares, and rapid extensive inflammation and softening of the cervical glands. On the fifth day, blood to the amount of 5 ounces was drawn from the arm of Emily P., aged eleven, a sister of the patient. She gave a clear record of a scarlatina attack, somewhat mild, two weeks before. She was not so ideal a subject to furnish blood serum as was the mother used in Case I. Our patient, being in great danger, received an injection of this serum amounting to 6 drams as soon as it formed above the clot, about noon February 23d; also another injection of 3 drams that night, and again the next morning and noon, 2 drams of blood serum each time being used. In this case, altogether 1 ounce and 5 drams were used. The improvement was not so rapid as in the preceding case. It apparently held its own for about three days and then steadily gained until convalescence was well established within a week. The unit strength of the serum used in these cases reported has unavoidably been uncertain.

CASE III. Mildred S., *aet* sixteen months, was attacked on November 21, 1912. She was attended for four days by another physician. She was in profound coma at my first examination (November 25th). Pilocarpin and warm baths and purges failed to produce the desired reaction. An older brother, Albert S., was convalescing from a scarlatina attack of very mild type, beginning a week before. Such was the natural conclusion from the history given. He was not by any means an ideal subject to furnish blood serum for several reasons—the fact of his having had scarlatina was not positively established; if he had had it, it had been very mild, hence the antitoxin-producing reaction had been mild; sufficient time for serum elaboration was wanting in his case; and, lastly, he was not able to furnish blood freely. However, he was the only available subject and so he was used. One and one-quarter ounces of blood were obtained November 26th, and injected as promptly as the supernatant serum gathered (4 P.M.), amounting to 4½ drams. November 27, I again bled Albert S., drawing 3 ounces and injecting 4 drams of the serum into Mildred at 12:30 P.M. At 10 P.M. (November 27) injected 3 drams of serum and next day 1½ drams more. No improvement could be noticed in this case under treatment. I record it to be fair in the statement of the blood serum treatment, although the fact of beginning treatment late and using a very questionable blood serum should also be emphasized.

CASE IV. George H., *aet* two and one-quarter years, was attacked January 25, 1913, and examined next day. Diagnosis evident from aspect of fauces and skin. Pilocarpin was used to stimulate excretion. The case seemed to be of only moderate severity, but in spite of the usual antiseptic washes, sprays, etc., by the fifth day the case had an aggravation of symptoms, especially faucial and nasal putrefaction, which made the prognosis very uncertain. At the solicitation of the child's mother, the adult immune who furnished blood serum for Case I., above reported, consented to be bled. Three and one-half ounces of blood was drawn, and at 6 P.M., January 30th (fifth day of the disease), 2½ drams of serum were injected. Three subsequent injections of 3 drams each were made at eighteen-hour intervals. The improvement in this case was decided within eighteen hours of the first injection, and, although a bronchopneumonia had begun and for a week retarded recovery, the primary scarlatina showed a steady subsidence, convalescence being well established by the second week. In this case, like the one reported above, the cervical glands, though considerably involved, subsided without suppuration.

In regard to the therapeutic use by others of the blood of scarlatina immunes, I find only isolated instances. It would be necessary in the proper course of things to establish proof of the efficiency of this method by extensive laboratory animal experimentation. However, if we place in the infected child that which in the blood of the immune is what makes them immune, we shall, it is reasonable to assume, place in the suffering child a sort of partial or artificial immunity directly proportional to the quality and quantity of the blood furnishing immune's serum introduced.

The method as presented offers a difficulty sometimes insurmountable, to wit, the obtaining the proper subject to furnish the blood-serum. Even when a most promising immune subject is found, the consent to be bled for others is not always easy to be obtained. Then the question of "bad blood" always arises, the question of what besides scarlatina immunization might be imparted to the child of an undesirable and injurious nature. So in my own experience, with these two considerable objections in mind, I have not deemed the method expedient except in cases that seemed to be desperate, or about to become so.

Naturally, in addition to its therapeutic value, its utility as a preventive is to be considered. The matter of rendering children, who are not yet attacked, immune to scarlatina in the presence of an epidemic of a malignant type in the neighborhood, or of other cases more or less severe in the same home or school, is well worth considering, and, I believe, undertaking without delay. This position I take because of the frequent failure of other therapeutic measures, and because the full demonstration and complete confirmation of such a remedy as described in this paper might require too long a wait. In fact, in the nature of the case, just such a serum, that from human blood, it is hardly likely can ever be supplied through the regular pharmacy channel. Its applicability if accepted as at all established must be limited to cases where the scarlatina immune who is appropriate as a serum supplier is available. Yet, in desperate cases where both the attendant and the family interested are determined to use every means, it is probable the serum can nearly always be obtained. Case IV., above recorded, illustrates how the mother of the stricken child went a long way, and with tears and pleadings was successful with arguments which, I dare say, only a mother could use with another mother.

As far as I have been able to ascertain, there have been but a few isolated cases where attempts have been made to combat the severe type of scarlatina with human blood serum. The German clinicians, as usual, have made a number of reports of results which vary but little from what is offered in this paper: Huber, Blumenthal and von Leyden reporting favorably, while Rumpel, Scholz and others do not. The blood made use of in those reported cases seems to have been taken altogether from convalescing scarlatina cases, while in the cases here reported the blood is preferably taken from an immune a long time after having had the disease. The question at once arises, Does the interval allow time for better and stronger antitoxin elaboration in the subject used, or does the desired ingredient weaken progressively after convalescence? The analogy in the preparation of diphtheria antitoxin by the equine method might throw some light on the question. I can only say that what was apparently the most positively effective serum I used came from the mother who had had severe scarlatina some years before; the least effective, if effective at all, from the brother, who was just able to get about. Aside from the very ancient method of treating all kinds of cases of hemic depletion by blood transfusion, which was with a purpose quite different from the one set forth in this paper, there are several somewhat analogous methods recently published. One by Curtis, of Chicago (*Journal of the American Medical Association,* February 28, 1914), by which he treats serious nausea gravidarum with hypodermic injection of small amounts of blood and blood serum taken from other pregnant women. His results were good, but his arguments were based on but one case. His offering is therefore only suggestive and cannot be taken as a demonstration of proof. What I present here is, I fear, open to the same criticism. But while I offer only

4 scarlatina cases, with 3 recoveries, the value of my results are proportional to the exceeding severity of these cases. We know that there is hardly any disease in the whole category of infectious diseases which at times occurs in such very mild, often unrecognizable forms, as scarlatina. But the cases here reported were not only severe attacks, but of such hopeless malignancy that the consultant agreed with the attendant that death was always the outcome to be ordinarily expected in such cases. With a disease to deal with of such variability of intensity, deductions of observers as to the results of any particular serum therapy must be taken with due allowance for the fact that the cases observed may have been either of the 3 per cent. fatality type on the one hand, or of the 40 per cent. fatality type on the other. I therefore assume with some warrant, I think, that presenting only cases of the most malignant and fatal type, I thereby add corresponding value to the deductions which I have dared to make.

If Sir Isaac Newton, contemplating the vast height and depth and breadth of the physical universe, and recognizing the small proportion of its laws and phenomena yet understood, said that he felt like a child standing on the shore of an unexplored and illimitable ocean, discerning only the pebbles and tiny shells at his feet, so we medical men of today, in contemplating the vast possibilities of serum medication in the eradication of disease, must feel like Newton, that we have as yet attained only the paltry pebbles and shells lying at our feet.

CHOREIFORM MANIFESTATIONS IN POLIOMYELITIS.—At the recent French Congress of Pediatrists Netter and Ribadeau-Dumas reported the case of a six-months-old-infant who presented the following manifestations of poliomyelitis: Paralysis of both legs, one arm, and the upper part of the other arm; nystagmus, choreic movements of the facial muscles, and protraction of the tongue. Lumbar puncture showed a lymphocytosis. The infant died in the course of a complicating bronchopneumonia. Autopsy showed the characteristic lesions of poliomyelitis. Choreiform movements are frequently observed in the course of experimental poliomyelitis in the monkey, but are exceptional in the human cases.—*La Presse Médicale.*

CASE REPORTS

HEMIPARESIS AND HEMIPLEGIA AS AN EARLY SYMPTOM IN TUBERCULOUS MENINGITIS.

BY PHILIP S. CHANCELLOR, M.D.,

From the Otho S. A. Sprague Memorial Institute Laboratory of the Children's Memorial Hospital, Chicago, Ill.

Jean C. was admitted to the St. Joseph Hospital, Chicago, at the age of three years. Her mother had died of tuberculosis the previous year.

Five days before admission the child was constipated, complained of feeling tired and the next day vomited. The temperature was 100°F. At that time she had a spasm affecting the whole body, lasting about two hours. The next day she felt better, but the following day, that is, two days before admission, attacks of convulsions occurred that became gradually more severe, lasting about four hours. Twitching of the left eye, and of the left side of the body was noted particularly during this attack. The temperature rose to 105°F. The following day the left arm and left leg were partially paralyzed, permitting only slight voluntary movements. There was no rigidity of the neck.

On admission, March 22d, the child was somewhat drowsy, and did not move either the left arm or left leg, which showed a flaccid paralysis. There was edema of the right leg; Babinski was present on the left; Kernig absent; marked hyperesthesia of left side; patellar reflexes absent; pupils react to light and accommodation.

March 25th. von Pirquet positive. Tuberculids. Pupils react to light and accommodation. Movement of eyes unimpaired. Eye grounds normal.

March 28th. Lumbar puncture. Fluid escapes under some pressure; clear. No microörganisms found. Potassium permanganate index 3.7 (Mayerhofer).

March 31st. Bronchitis.

April 1st. Babinski, pronounced on left; patellar reflex normal on both sides.

April 4th. Clonic convulsions of right arm and leg, nystagmus, pupils unequal.

April 4th. Choked disk.

April 7th. Babinski on both sides. No Kernig. Brudzinski positive. Tendon reflexes of left arm increased. Ankle clonus on right. Ptosis of right eyelid. Pupils dilated and do not react to light.

April 8th. Both extremities stiff and straight. Fingers, wrist and feet strongly flexed.

April 9th. Died.

The temperature during the course of the illness varied between 99.4° and 103.4° F. The constipation lasted throughout the illness.

This case presents some features of interest particularly in regard to the onset of the symptoms pointing to an involvement of the central nervous system.

Koch cites a number of authors recording cases of tuberculous meningitis beginning with convulsions and paralysis. Hirschberg describes a typus inversus usually seen in adults, in which paresis of one arm or leg, or both, or of one side of the body, occur, with convulsions and aphasia. Schlesinger reports a case in which convulsions of one side of the body, lasting for hours, ushered in the disease, being followed by a complete paralysis with aphasia. Zappert saw 4 cases, all beginning with vomiting, constipation and convulsions, followed shortly by paralysis. To these cases Koch adds 2 of his own, in 1 of which a hemiparalysis supervened following an attack of convulsions, while in the other one arm was paralyzed, following a severe headache, particularly on the opposite side.

The case whose history is given briefly above belongs to this group. The most characteristic features of this group are the early onset of a more or less pronounced paralysis, limited to one side of the body, either as a mono- or hemi-paresis, rapidly terminating in a general paralysis.

This paralysis may be transient, as, for instance, in the case of Schlesinger and 1 case of Sauer. Such conditions may easily mislead one to a diagnosis of anterior poliomyelitis, particularly when, as in the case reported by Sauer, the paresis is not preceded by convulsions.

In the case just reported, as well as in those of Hirschberg, Schlesinger, Zappert and Koch, the paralytic symptoms were not the first ones, arousing a suspicion of a meningitis, being preceded by convulsions and severe headache, thereby distinguishing themselves from the hitherto unique cases of Sauer, wherein the rapidly progressing one-sided paresis was the first symptom definitely pointing to an involvement of the central nervous system.

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IMMUNITY OF THE WHITE RAT TO THE DIPHTHERIA TOXIN. —A. Pettit reported before the Société de Biologie, June 7th, the results of his investigations on this subject. He found that this animal possesses a resistance to the diphtheria toxin to an extent greater than any other mammal. Whereas a dose equal to one fifteen-thousandth of the body weight kills in less than forty-eight hours, it is necessary to give an amount exceeding one one-hundredth of the body weight to accomplish this result in the rat. This resistance is not dependent upon the antitoxic properties of the blood serum or upon the power of leukocytosis, but is the result of the natural immunity of the body cells.—*Gazette des Hopitaux.*

CLINICAL STUDIES ON THE CURATIVE ACTION OF LEUKOCYTE EXTRACTS IN INFECTIVE PROCESSES.—Hiss and Dwyer (*Medical Record,* September 13, 1913) report on a series of 148 cases of erysipelas treated with leukocyte extract. They observed uniformly beneficial effects on the local lesion, the constitutional symptoms and the duration of the disease. The same extract was used in another series of 50 cases at Bellevue Hospital, where infections treated with it within the first forty-eight hours were aborted. The spreading intractable lesions of the back and body were affected as readily as those occurring on the face and head. About 50 per cent. of infants under one year treated thus recovered.—*Boston Medical and Surgical Journal.*

JACKSTONES IMPACTED IN THE ESOPHAGUS. REPORT OF 3 CASES IN FOUR DAYS. ONE DEATH

BY GEORGE MORRISON COATES, A.B., M.D.,
Philadelphia, Pa.

CASE I. K. V., twelve months old, was brought to the receiving ward of the Pennsylvania Hospital early in the evening of April 20th with a history of having swallowed a jackstone fifteen minutes previously. Dr. Bromer, the interne on duty, was able to see the upper end of the stone when the child gagged violently, lodged behind the larynx in the mouth of the esophagus. Before notifying me he inverted and shook the child in the good old-fashioned way, possibly dislodging the stone slightly, when he was able to extract it successfully with a long pair of curved hemostats during the act of gagging. It was of the usual six-pointed variety. There were no further symptoms and a good recovery was made.

CASE II. On April 20, 1914, Anthony Lombardo, seventeen months, was brought to the receiving ward of the Pennsylvania Hospital late in the evening with the history of having swallowed an ordinary six-armed jackstone. The fluoroscope showed the stone in position about the suprasternal notch, and, as the child did not seem to be inconvenienced, the interne on duty sent it home with the instruction to report at once if anything went wrong. He was brought to the receiving ward again about 9:30 A.M., April 21st, with very great dyspnea and a marked croupy inspiration. This had come on during the night. While waiting for my arrival the chief resident made an effort to get the stone with the Jackson laryngeal spatula, but could not dislodge it. At 10 A.M., without ether, the child being quite exhausted and nearly in collapse, the stone was removed with the Jackson bronchoscope and Bruening forceps with little difficulty or traumatism, although the stone was impacted fairly tightly below the cricoid. Breathing improved somewhat, but was not free all day, still having the croupy inspiration. The child died suddenly at 10 P.M. The nurse and resident said that apparently death was not due directly to respiratory obstruction. An intubation tube was slipped into the larynx with ease, but probably just after death had taken place. At all events it produced no results. The jack was a six-pointed stone, size thirteen-sixteenths of an inch from tip to tip, and was apparently wedged with one point against the spinal column and the other pressing on the trachea, which would account for the dyspnea. At the time of removal the larynx appeared congested, but otherwise normal. No autopsy was obtainable and the direct cause of death can only be surmised. It would seem that no rupture of the esophagus had taken place and certainly there had been no time for infection, to which so many of these fatalities have been due, to have occurred. This sudden death, therefore, probably must have been caused by shock from the traumatism produced by the wedged-in stone, or the process of extraction, or to subglottic edema. The failure of the respiration to entirely resume its normal character after the removal of the obstruction would point to this latter cause, but it may have been a combination of both, since it is well established that the esophagus is not at all tolerant to traumatism or operative interference. Interference with respiration might have been caused by a thymus gland acutely inflamed from the twelve hours' pressure of the jackstone.

CASE III. Tony Biazello, a child of twenty-four months, came to the Pennsylvania Hospital on April 24, 1914, with the identical history given by the two previous cases. The fluoroscope plainly showed a jackstone lodged in the esophagus about the suprasternal notch. There was no interference with respiration and apparently little pain. The jack had been in position about an hour. An attempt was made to deliver the stone without ether, but the child, being strong and well nourished, resisted so successfully that it was deemed wise to etherize. Under light ether anesthesia, therefore, the stone was brought into view with a Jackson bronchoscope, seized with Bruening's forceps with a serrated tip, the same as used in Case II., and the stone easily delivered, with only a little bloody mucus showing. Cold applications were kept on the neck for twelve hours and the child carefully watched, but nothing further of interest developed and uninterrupted recovery was made. The jackstone in this case proved to be smaller than the last, measuring eleven-sixteenths of an inch from tip to tip.

The interest in these cases lies in the coincidence of 3 coming to the same hospital in four days with a history of the same accident having happened to each, and in the unfortunate termination of the second case. They are reported by the writer for this reason, and for the information of those gathering statistics.

1736 Pine Street.

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held April 9, 1914.

WILLIAM P. NORTHRUP, M.D., CHAIRMAN.

The evening was devoted mainly to a symposium on Whooping-cough.

BLUE SCLERA WITH FRAGILITY OF BONES.

DR. CHARLES HERRMAN presented a child twenty months old with blue sclera associated with fragility of the bones. The parents of the child were healthy and there were 3 other children who were healthy and who began to walk and talk at the proper age. The patient had been nursed for ten months, had digestive trouble occasionally and was always delicate. The first teeth appeared when the child was seven months old and she was able to sit up at nine months, but had never been able to stand or talk. In December, 1913, she fell from a chair and fractured the right tibia, and six weeks later, while in bed with the cast applied, she fractured the right femur. The patient shows a skull with a short antero-posterior diameter and prominent brow. The sclera were distinctly blue, not the bluish tinge seen frequently in tuberculosis, but a pale china blue. There were no marked signs of rickets. The fontanel was closed, the child had twelve teeth, no rosary or enlargement of the epiphyses. The occurrence of the blue sclera had been noted by several English ophthalmologists. They were distinctly blue and the color was uniform throughout. Bluish patches the speaker said he had noticed in a number of colored children. The English observers had reported families in which several generations showed this peculiarity. It was usually transmitted through its female members; not all the members of the family, however, showed the blue sclera, and not all who had the blue sclera had fragile bones; but all those who had fragile bones had blue sclera. A somewhat similar sclera was seen in congenital heart disease and might be due to a similar cause, lack of fibrous tissue allowing the choroid to show through the thin sclera.

The fragility and lack of elasticity in the bones was probably due to a similar change in structure. As far as he knew no pathologic examination of the sclera and bones had been made in these cases. Radiographic examinations were made in this patient while the plaster cast was in place, so the minute structure of the bones was not shown. Now that the cast had been removed another radiographic examination would be made and the result shown at another meeting. The relation which these cases bore to those of osteogenesis imperfecta or fragilitas ossium was interesting. They seemed to bear some relation to the late cases of the latter disease. The condition was rare and only recently had been described. This point could not be decided without careful radiologic and pathologic examination.

THE ETIOLOGY OF WHOOPING-COUGH.

Dr. Anna Wessels Williams read this paper. (See p. 567.)

THE CLINICAL AND SOCIOLOGICAL ASPECTS OF WHOOPING-COUGH.

Dr. John Lovett Morse, of Boston, Mass., said that he knew no more of the clinical aspects of whooping-cough than they all knew, and if he knew more of the sociological aspects of the disease it was because he made a study of these a year ago and had collected statistics in regard to the incidence and mortality of whooping-cough, which he had presented in a paper read before the American Pediatric Society in May, 1913, of which this talk was largely an excerpt. (See paper in full on p. 572.)

THE NEED OF HOSPITALS FOR WHOOPING-COUGH IN NEW YORK CITY.

Dr. Godfrey R. Pisek said that New York City might well be proud of its mortality record, particularly as it applied to children under five years of age. If the investigation which had just been made of our municipal institutions had been extended to the accommodations which they had provided for cases of pertussis, the survey would not have consumed much time. In this regard our municipality was no better, and not much worse, than any of the other great centers of the world in the regulations and care provided for patients with whooping-cough.

Pertussis, mainly through its commonest complication, carried away a large number of the children of New York every year. There were in the year 1913 a total of 420 deaths of children from whooping-cough in the Greater City. Of these, 49.5 per cent. occurred in the first year of life; 33.4 per cent. of the deaths occurred in children between one and two years of age; 8.8 per cent. between two and three years; 5.2 per cent. between three and four years; 1.9 per cent. between four and five years, and 1.2 per cent. in children over five years. It was a well-known and deplorable fact that many children succumbed to tuberculosis following their paroxysmal attacks. The incidence of whooping-cough and the mortality in Greater New York since 1910 was as follows: In 1910 there were 2,018 cases with 294 deaths; in 1911, 3,210 cases with 384 deaths; in 1912, 2,132 cases with 287 deaths, and in 1913, 3,529 cases, with 420 deaths. Compared with the deaths from other diseases of childhood, there were, in 1913, 1,333 deaths from diphtheria, 628 from measles, 507 from scarlet fever and 420 from whooping-cough. In children under the age of five years there were more who were attacked with whooping-cough than with scarlet fever. While there were 415 children under five years of age who had whooping-cough in the year 1913, there were only 12 who had typhoid fever. There was ample hospital provision for typhoid fever and yet the mortality from pertussis was far greater than that of typhoid fever.

For diphtheria, scarlet fever, and just recently for measles, hospital facilities had been provided, but for a disease which commanded a toll almost equal to that of scarlet fever practically no provision had been made. There were in New York City 1,884 available beds for infants and children in the public and semi-private hospitals and 2,350 beds in the various hospitals for contagious diseases. At the present time there were set apart ten beds in Bellevue for complicated cases of pertussis and thirty beds at the Metropolitan Hospital on Blackwell's Island.

If whooping-cough had only been born with some kind of a rash it would not now need any advocates to point out the dangers with which it was attended. As it is, the laity regarded it as not particularly dangerous and physicians often fostered this idea or expressed their hopelessness in the face of it, so that comparatively little medical attention was given it until the patient had serious, and often fatal, complications. Believing that only a comparatively small number of cases of pertussis reached the physician and that by no means all of these were reported by him, the deaths ascribed to whooping-cough during the last six months were tabulated. They made an investigation as to the number of these actually reported, and it was found that only 1 in 63 had been previously reported to the department, that 3 were reported by school nurses, and that one was sent in on the day of death. The figures of the Department of Child Hygiene, relating to contagious diseases, reported by the inspectors in the schools, or found at home, were interesting in this connection. In 1912, 372 cases of whooping-cough were found at school and 466 by absentee visits, or a total of 838. In 1913, 291 were found at school and 445 by absentee visits, or a total of 735 cases. The health authorities have required that the disease be reported and the child excluded from school, but further than that they had not acted. The reason for this lay in certain difficulties that differentiated this disease widely from the other contagious diseases. The comparatively long first stage in which the diagnosis was often uncertain for days, and the long duration and questionable period of "safety for others" made the disease difficult to handle from the Health Board standpoint.

In attempting to formulate any plan for control we must recognize their valid objections to general hospital care, but there still remained much to be said in favor of the hospital care of cases with complications or segregation of those affected.

Among our large population there were constantly appearing cases of whooping-cough in families who were unable to provide medical care for them because of poverty. They were compelled to go to the dispensaries. From these, after having waited and mingled with other children, they were singled out as pariahs and sent home, often untreated, because of lack of suitable provisions and with no instructions as to the care and prevention of the spread of the disease. Where the mother was the breadwinner, the child not being admitted to a day nursery or a hospital, she was obliged to abandon her livelihood and thus from an economic standpoint we were obliged to consider adequate provision and control of this disease. Likewise an infant with bronchopneumonia, whose needs were judicious stimulation, skilled nursing and abundance of fresh air was deprived of these and allowed to die in its tenement house for lack of municipal facilities. Besides these urgent needs for the care of patients with whooping-cough there was a dearth of measures for prevention. Constructive recommendations must be practical, enforceable and economically possible. If an intensive study of the disease were made in a selected section of the city it seemed certain that many more cases of whooping-cough would come to light than were ever reported, and on a more accurate basis the need of hospital beds could then be apportioned, and the public notified that the city was ready to care for those who were in need. At the present time there were no suitable available buildings. These should be built on the open pavilion plan near the water fronts, and especially designed for this purpose—at least one for each borough. For the great number of uncomplicated cases who go about spreading the disease, disused ferry boats or barges moored to the city docks could be utilized; on these a small hospital ward could be arranged for those needing medical attention and feeding. Dispensaries for ambulant cases of whooping-cough could be held here, and cases could be referred here from other clinics. Children with their mothers could be taken in stages provided by the city to those boats and allowed to spend the day outdoors, returning to their homes at night. With such a plan a large number could be educated to follow proper methods of prevention; well children could be spared contact, and deaths from complicating conditions prevented. That the disease was very prevalent in this section was shown by Dr. Pisek's own case histories, the last 500 of which, under ten years of age, showed 45.8 per cent. to have had whooping-cough.

There could be little question but that provision for whooping-cough cases would promote the public welfare and, moreover, would give physicians an opportunity to study the disease as to its early diagnosis, and to perfect the treatment along more scientific lines, now that the specific organism was known.

To this end the writer recommended that a committee from the members of this Section should be appointed who should present to the Commissioner of Health a recommendation urging the establishment of wards for urgent cases of pertussis, and segregation centers for uncomplicated cases.

WHAT THE HEALTH DEPARTMENT HAS DONE WITH WHOOPING-COUGH.

Dr. John S. Billings, representing the Commissioner of Health, said he had been requested to describe briefly what the Health Department was doing in regard to whooping-cough and what they purposed doing. Dr. Williams had already described some important lines of work and he wished to speak of what they were doing in the way of sanitary supervision. Prior to the reorganization of the Bureau of Infectious Diseases they had not been active in combating whooping-cough except to require that cases be reported and that they be excluded from the schools. Cases of whooping-cough were not visited. With the reorganization of the Department and the establishment of the Bureau of Infectious Diseases sanitary supervision of whooping-cough was carried out by the nurses as far as possible. The new plan had only gone into effect January 1, 1914, and the first month had been spent in breaking in the nurses. As was usual during February and March their time was all required in handling measles and scarlet fever, so that they had so far had no time for visiting whooping-cough cases, but as soon as possible the nurses would visit the homes of whooping-cough patients. The mothers or heads of families were sent a card describing the dangers of whooping-cough and giving the precautions that should be taken to protect others from the disease. When the paroxysmal cough was no longer present the child could be readmitted to school. A comparison of the death certificates with the cases reported showed that notification was not closely observed, but they had not been drastic in enforcing this measure. The nurses would keep the children under observation and if the regulations laid down by the Department were not observed the child would be removed to a hospital.

As was already known, Dr. Goldwater had enlarged the Department of Publicity. Ten thousand copies of the *Bulletin* were now sent to physicians weekly and through this they hoped to get the coöperation of the profession in their efforts to control whooping-cough. He hoped that they would soon have a camp hospital for whooping-cough cases. They had made arrangements to use the boat of St. John's Guild, the *Helen C. Juilliard,* this winter and had expected to moor it off the Willard Parker Hospital, but the Minturn Hospital authorities objected, fearing lest its moorings would menace the foundations of their buildings. The *Middletown,* a smaller boat, could be used in this way without causing trouble.

Since January 1, 1914, the Department has maintained one whooping-cough clinic in Brooklyn, where during other hours a Wassermann clinic is also held. This clinic was not in a tenement district and so was not patronized to any extent. In 1913 they had received a request from the Association of Out-patient Clinics for information in regard to establishing special clinics for whooping-cough cases. A survey of the institutions and dispensaries in New York City showed that of 116 institutions there were 38 to which whooping-cough cases applied for treatment; 78 had no such applications; of these 38, 34 treated cases that applied. There were 2 dispensaries that used vaccine and 28 that employed drugs. Five institutions had physicians visit whooping-cough patients in their homes.

In reply to the question, "Do you report cases of whooping-cough?" sixty-seven institutions said they did not report whooping-cough, and forty-nine said that they did report it. In reply to the question, "Do you have special postals for this purpose?" sixty-eight institutions had no such postals, while forty-eight had them. In reply to the question as to whether they wished to establish special classes for whooping-cough there were no positive answers, but fifteen said that they would consider the question. Fifty-five said they did not care to have such special classes. After the requirements were explained to them 101 said that they could not comply with them, and fifteen thought that they could. An inquiry into the methods of examining applicants showed that 102 of the institutions did not make any preliminary examination of applicants. The requirements of the Health Department for special whooping-cough clinics would probably be that the quarters used for this purpose should open directly on the street; that they should not be used for any other purpose; that they should be thoroughly scrubbed and cleaned after the clinic, and the windows left open during the entire time when not in use. Such clinics should be located in the tenement districts of the poorer class, as it was useless to establish such a clinic unless it was within walking distance of the people who would attend it. No person having whooping-cough should use a public conveyance and the same care should be exercised in handling the sputum as was employed in cases of tuberculosis.

DR. JOHN WINTERS BRANNAN said they would have to acknowledge that their provisions for the care of whooping-cough patients were woefully inadequate. The meeting this evening had been one of the most important from the standpoint of public health that had been held in years. He regretted that they had failed to get a whooping-cough boat this year, but hoped they would have one next year. There were few places around Manhattan suitable for such a boat, as it was necessary that it should be located near a hospital.

DR. ROWLAND G. FREEMAN said that they were greatly indebted to Dr. Morse and Dr. Graham for their valuable contributions. Concerning what Dr. Morse had said in regard to the spread of whooping-cough he would like to emphasize the point that it was difficult to limit the spread of this disease during the first two weeks, as it was often impossible to make a definite diagnosis. Two points, however, were of great value—these were a persistent increasing cough without other catarrhal symptoms and a high lymphocytosis. If a child over three years of age with a suspicious cough showed a lymphocytosis approaching 50 per cent., the diagnosis was fairly certain. While infant mortality and general mortality had markedly diminished in recent years contagious diseases showed little diminution. This was because the diseases were largely spread by the schools and no effective action had been taken to prevent their spread. This could only be prevented by keeing children who had been thoroughly exposed to contagious disease away from school during the latter part of the period of incubation, and such rules were now in force in the best private schools of New York.

DR. CHARLES GILMORE KERLEY stated that the mortality statistics as given for whooping-cough did not give a proper impression of the extent of the ravages of that disease, as it played an important part in diminishing the resistance of the child and thus lessening its chances of surviving the diarrheal disease of summer. The same was true with reference to tuberculosis; with the diminished resistance following whooping-cough the child more readily fell a victim to this affection.

As to isolation, if the child was taken out of school it went into the street and there mingled with other children. With reference to isolation in the family, by the time a diagnosis of whooping-cough was made every other child in the family had been exposed. Mild cases were very difficult to diagnose and there was at present an epidemic of these mild cases in the city.

What had been said in regard to changing the room of the whooping-cough patient was correct; it was a great advantage for the child to have a different room to sleep in from the one it occupied during the day.

With regard to the statement that the cases treated by the local application of nitrate of silver all improved after three or four weeks; any case would be better by that time. He had found quinin alternated with bromid of sodium and antipyrin very acceptable.

In an interview with Dr. John Freeman last summer he had found that Dr. Freeman was not so enthusiastic in regard to the vaccine treatment of whooping-cough as his statistics given by Dr. Graham would lead one to suppose. Dr. Kerley said he had asked Dr. Freeman if he would give the vaccine to his own children and he replied that he had done so. As to the results, he said the nurse girl thought that they did some good, but he was not so sure. Dr. Freeman said that the vaccines did no harm and the usual dose was 200,000,000 twice a week. He had used the pneumococcus vaccine with these and thought this was an advantage in preventing pneumonia.

Dr. Matthias Nicoll, Jr., said that he had read all the reports in regard to the value of the vaccine treatment, but had never seen one in which an analysis of the case records as given convinced him of the great value of the remedy, although many of the writers drew favorable conclusions hardly warranted by the statistics. From what Dr. Williams had said of the probable variable nature of the infecting organism, it was logical to expect variable results with the employment of stock vaccine. Very great differences in the clinical course of the disease, as well as the character of the prevailing epidemics, made the reports of a few cases of little value as a means of judging the specific action of the remedy, especially if controls were not used in practically every case. In the last analysis the strictest test of the value of a specific remedy must be its power to prevent a disease and a vaccine that could not do this could hardly be expected to overcome a disease when once established. A small number of cases had been reported in which such a protective action seemed to have been established. However, the number of such instances was by no means sufficiently large to warrant positive conclusions, for it must be remembered that all children did not take the disease even when very fully exposed to it. For instance, Dr. Nicoll had gone into a children's ward in which the forty or more occupants had lived for three or four months, during which time about 30 of the children had contracted the disease while the others, most of whom were from one to two years of age, escaped in spite of the closest and most constant contact. The contemplated immunity experiment in this instance was naturally abandoned. During the past eight months by the Research Laboratory about 80 cases of whooping-cough had been treated with vaccines and the course of the disease followed as carefully as circumstances would permit. The cases had been treated in institutions, in clinics, and in their homes, either by members of the laboratory staff or by private physicians and hospital staffs. Three strains of vaccines had been used; the first was made from imported Bordet-Gengou strains combined with three strains of hemoglobinophilic organisms isolated from cases of whooping-cough; the second was made from the same imported organisms combined with two strains of somewhat atypical Bordet-Gengou organisms from local cases giving a similar complement fixation reaction as the former; and the third was made from four strains of typical Bordet-Gengou organisms isolated from local cases. The results of the treatment had varied markedly. A number of cases showed very distinct and rapid improvement; others seemed to be little affected. The mild character of the symptoms observed since early autumn had done much to prevent a definite opinion as to the real value of specific treatment, many cases not treated running a very favorable course. In brief, it might be said that there was an indication of value in many of the cases treated with vaccine, but in order to form a really definite opinion it would be necessary to treat many more cases and to have the children under such observation as would render the clinical reports of much more value than they had hitherto possessed. The present lack of effort to control and care for the disease was a disgrace to the community, and it was to be hoped that the Department of Health would continue to direct its attention to this problem. The setting aside of ten additional beds was little more than an entering wedge. He thought he voiced the opinion of every physician who had the welfare of the community at heart when he stated that the authorities should take action immediately to solve the problem of a disease which had killed nearly 500 children in the City of New York during the past year and especially that provisions should be made for the care of young children having whooping-cough complicated by pneumonia and unable to be placed under the care of a private physician.

Dr. Haven Emerson said he had come to listen and not to speak, but he could assure them that the activities of the Health Department would be increased along this line.

Dr. S. J. Meltzer asked Dr. Williams whether the statement he had heard made that Mallory had been working in his experiments with the B. bronchosepticus, that is, the distemper bacillus instead of the bacillus Bordet-Gengou, was true.

Dr. Williams replied that Mallory had stated, as she had said in her paper, that his animal experiments were not sufficiently controlled; that possibly the animals might have had the B. bronchosepticus.

Quinin in Urticaria.—Wolff (*Boston Medical and Surgical Journal,* September 5, 1912), of Berlin, first observed the efficacy of quinin in urticaria in his six-year-old daughter, who had suffered during the spring for several weeks with an attack of this affection that had defied different modes of treatment, both external and internal. Quinin was suggested by an article by Bergrath, of Neisser's clinic, on the successful action of quinin in pemphigus, inasmuch as the case of urticaria was complicated by the formation of bullæ (urticaria bullosa). The administration of gr. jss. of quinin three times daily after eating caused a rapid disappearance of the affection. Thereafter Wolff tried this remedy in 6 cases, too small a number, he confesses, from which to draw definite conclusions, but the results in all of these cases were most brilliant, and, inasmuch as the drug is a relatively harmless one, further trials seem indicated. In urticaria there is, judging by the symptoms, an irritant which acts upon the vessel nerves, especially on those of the skin. It is to be assumed that this irritant is represented by a chemical substance that is generated in the intestinal tract. So much is common to all the theories of pathogenesis of urticaria. According to the etiology, it is possible, therefore, to obtain favorable therapeutic effects from the employment of different medicaments. Most cases of urticaria are surely caused by an intoxication arising in the intestinal canal, an anaphylaxis, as has been maintained of late. Quinin may also prove of value in other affections that may be due to anaphylaxis.—*Universal Medical Record.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

May 5, 1914.

WILLIAM N. BRADLEY, M.D., PRESIDENT.

Special Public Meeting upon the Value of Animal Experimentation in the Diseases of Children.

THE VALUE OF ANIMAL EXPERIMENTATION IN THE DIAGNOSIS OF DISEASE IN CHILDREN.

DR. ALFRED HAND, JR., read this paper. He emphasized the importance of diagnosis, for without exact diagnosis treatment cannot be scientific. With the development of bacteriology and the discovery that germs were associated with infectious diseases a need arose for standards to determine the true relations between them, and Koch formulated certain postulates. These have been fulfilled in about half of the infectious diseases, yet much work remains to be done. The Widal test in typhoid fever, discovered through animal experimentation, is of great value; in the small group of cases in which it may be negative bacilli can be isolated from the blood or discharged and identified by agglutinins obtained from animals. The diagnosis of meningitis depends on lumbar puncture; in the tuberculous form it may be necessary to inject fluid into guinea-pigs. This test is also used for enlarged glands in the neck, pleurisy with effusion, kidney conditions, and in the study of milk to determine the presence of tubercle bacilli. Much of our knowledge of tuberculosis resulted from animal experimentation, even the von Pirquet cutaneous tuberculin test. If specific treatment is ever obtained it will be through animal experimentation. So important is the study of throat cultures in the diagnosis of diphtheria that municipal and state governments furnish facilities for this; and at times culture tests are made upon guinea-pigs to test the virulence. Dr. Hand described 2 cases of rabies in which the diagnosis was established by autopsy and experiments upon rabbits. Syphilis has a high mortality in children, and accurate diagnosis is of great importance. The Wassermann test, recently discovered, places the diagnosis on an exact scientific basis, and uses a lower animal. The claim made by antivivisectionists that animal experimentation accomplished nothing has been shown to be false; now they oppose vivisection upon so-called morality. For the sustenance of the body it is necessary to consume some of the lower animals, and for the health of the body we need to use some of the lower animals to furnish us with defenses against sickness. Is there any difference between these?

THE VALUE OF ANIMAL EXPERIMENTATION IN THE TREATMENT OF DISEASE IN CHILDREN.

Dr. Henry Chapin, of New York, by invitation, read this paper.

Formula for the Determination of the Surface Area of Infants.—Certain physiological functions are directly dependent on the surface area of the body. For the determination of the surface area various formulas have been proposed. To this end, J. Howland and R. T. Dana (*American Journal of Diseases of Children,* 1913, Vol VI., p. 33) have constructed a formula of the $y = mx + b$ form, using the data supplied by Meeh and Lissauer. They have employed the weight as the only variable in the formula, as it is apparent from a study of the figures given by Meeh and Lissauer that the length and the circumference of the chest bear no necessary relationship to the extent of surface. In this formula,

y = surface area of child in square centimeters;
x = weight of child in grams;
$m = 0.483$;
$b = 730$.

Meeh was anxious to obtain a formula accurate for all ages of normal individuals; Lissauer, on the other hand, measured with one exception only poorly nourished and emaciated infants. Comparison of the results obtained by actual measurement and by the use of the formulæ of Meeh, Rubner and Heubner, Lissauer, and the present writers, it is seen that the gross error compares as follows: Meeh, 12.4 per cent.; Rubner and Heubner, 9 per cent.; Lissauer, 5.7 per cent.; $Y = mx + b$, or 0 per cent. It also demonstrates that the formula $y = mx + b$ gives trustworthy results for all classes of children, the well and the poorly nourished, while the other formulas that have been proposed are not accurate in this respect.

CURRENT LITERATURE

ABSTRACTS IN THIS NUMBER BY

DR. T. WOOD CLARKE.	DR. HAROLD R. MIXSELL.
DR. CHARLES E. FARR.	DR. MARK S. REUBEN.
DR. JEROME S. LEOPOLD.	DR. S. W. THURBER.
DR. C. D. MARTINETTI.	DR. E. T. WYMAN.

DR. J. HERBERT YOUNG.

DISEASES OF EAR, NOSE AND THROAT.

CANFIELD, R. BISHOP: A CASE OF RECURRING LARYNGEAL POLYPI WITH TETANY. (*Annals of Otology, Rhinology and Laryngology*, March, 1914, p. 93.)

A child two years and three months old had been growing more and more hoarse for six months prior to August, 1912, and for the past ten days had been showing a marked degree of dyspnea; cyanosis had been present for several hours, so that the respiration was gasping. A high tracheotomy was done and immediate relief obtained.

Nine months later the child was seen for the second time. He had been wearing the tube constantly and it had not been even removed for cleaning. The wound was in bad condition. Attempted removal brought on a brisk hemorrhage. This was stopped and two days later a bronchoscopic examination was made which revealed a mass of papillomatous tissue filling the larynx and extending down to the level of the lower end of the tracheotomy tube. This mass of tissue was removed and applications of absolute alcohol made; the tube was replaced. Two months later, the condition having not improved, a thyrotomy was performed and the growth thoroughly removed under ether. It was found to extend up onto the base of the tongue.

Ten days later the tracheotomy tube was removed, but had to be replaced and was worn for two months longer. At this time the larynx was intubated and the tube taken out of the trachea.

On December 13, 1913, the intubation tube was removed under suspension laryngoscopy, but edema quickly came on because of relief of pressure and the tube was reinserted. However, the edema became so great as to cover the top of the tube and it was necessary to replace the tracheotomy tube again.

Five hours afterward the child complained of being cold and developed a tremor resembling a chill; the temperature rose to

103.8°, respirations 28 to 40 and pulse 180. There was profuse sweating. Within two hours the tremor had developed into clonic convulsions, beginning in the face, then the arms, hands and fingers and lastly the legs. The convulsions became almost continuous and lasted several hours; the child became stuporous; opisthotonus appeared; erythematous rash developed over the chest and face. Three days after the first tremor the convulsions became tetanic and from then on the case was plainly one of tetany. The attack lasted thirteen days, during which optic neuritis developed from edema and the child was blind. After this the child gradually improved, vision returned and is good and the child still wears the tracheotomy tube.

The cause of the tetany is put down as either due to a toxemia from ether or an injury to the parathyroid from hemorrhage during some of the operative manipulations.

S. W. THURBER.

FRIEDBERG, STANTON: ESOPHAGOSCOPY. (*Annals of Otology, Rhinology and Laryngology,* March, 1914, p. 123.)

In this article the author draws attention to the fact that foreign bodies lodge in the esophagus nearly always between the lower border of the cricoid and the level of the suprasternal notch. A possible explanation of this may be found in the attachment of the inferior constrictor of the pharynx to the cricoid cartilage. It appears that there is a small triangular area just beneath the cricoid where muscular fibers are lacking; this would give a weak spot in the tube where there would be no propulsion during the act of swallowing and thus large bodies might stick where there is no push to force them along. Bodies in the esophagus are frequently passed by in the introduction of the examining tube because it naturally slides along the posterior wall and the foreign body may recede into a relaxed space just below the cricoid. Twenty-three cases are cited, all but 4 being in children, some of them mere infants, where such foreign bodies as the following were removed: toy ring, coin, marble, penny, tin whistle, metal toy, meat bone, button, watch wheel, safety-pin, three coins stuck together, several straight pins and some repetitions. In 2 cases the bodies were discovered, but passed into the stomach and were recovered later per natural passages. In 13 cases the age was under three years. There was one fatality, a boy of two years, where a number of attempts at removal of a coin had resulted in sepsis when he was brought into the hospital. These cases show the great value of the esophagoscope when rightly used and the danger of blind efforts at removal when such an excellent means of prompt relief is at hand. S. W. THURBER.

PAGE, JOHN RANDOLPH: A CASE OF PROBABLE INJURY TO THE JUGULAR BULB FOLLOWING MYRINGOTOMY IN AN INFANT TEN MONTHS OLD. (*Annals of Otology, Rhinology and Laryngology,* March, 1914, p. 161.)

As many men are incising ear drums, a note of warning may well be sounded, as this case shows that it is not difficult to injure a high and anteriorly placed bulb during a myringotomy. The injury to the large blood sinus is shown by a prompt and free hemorrhage which necessitates packing to control it. There may be bleeding from the nose from blood flowing through the Eustachian tube after the external meatus is packed.

In this case a double myringotomy was performed with a profuse hemorrhage from the left side, which required packing, but had ceased at the end of ten minutes when the packing was removed.

On the third day the temperature had gone to 105° and the child was found to have very extensive disease of both mastoids, which were operated upon. As the temperature did not go down following these operations the left jugular vein was resected and uneventful recovery took place. S. W. THURBER.

HOLMES, EDGAR M.: THE EPIPHARYNX IN CHILDREN. (*Annals of Otology, Rhinology and Laryngology,* March, 1914, p. 138.)

The author makes the statement that over 90 per cent. of all pathologic conditions met with in otology are due to some preexisting pathology in the epipharynx or Eustachian tube. He believes that by improved methods in treatment in this locality more and more ears can be saved. Many children affected with middle ear disease may be entirely relieved by simply removing their adenoids, but it is also well known that many more are but temporarily relieved and then become as bad as before.

Were it not for cicatrices and their effect upon the Eustachian tube the subject of adenoids would be very simple. A large number of the children referred to the specialist by school inspectors do not need an operation and are far better off without one. If an operation has been done, these children should be seen and examined a few weeks afterward with especial reference to adhesions about the Eustachian tubes. The author's nasopharyngoscope has been of great help in making a good satisfactory examination of the epipharynx.

Therapeutics are divided into two heads—general and local. Gastrointestinal conditions must be looked after; malnutrition and anemia and each child's resistance should receive attention. Infections of the epipharynx are almost always associated with those of the nasal cavities. The author advises against the douche and prefers medication by means of a dropper. A 10 to 20 per cent. solution of argyrol dropped through the nose has given satisfaction under his hands. The solution can be made to run into the ear or Eustachian tube by properly tilting the head when held over a table in Rose's position. The removal of bands of adhesion about the Eustachian tubes is done by means of special ring curets, the use of which requires some practice.

S. W. THURBER.

MEDICINE.

HOCHSINGER, C.: UEBER BEDEUTUNGLOSE GERÄUSCHE IN DER PRÄCORDIALGEGEND VON KINDERN UND JUGENDLICHEN. (THE INSIGNIFICANT MURMURS IN THE PRECORDIAL REGION OF CHILDREN AND YOUNG ADULTS.) (*Archiv. für Kinderhk.*, 1913, p. 377.)

Murmurs without pathological meaning are far more frequently found in children than in adults, and in the young children more frequently than in the older. These murmurs are always systolic; in children there are never found any diastolic murmurs without pathological significance. Of 1,028 healthy school children examined by Hammill, Boutiller, Lüthje and Beyer, 764 had systolic murmurs. Butler believes that 64 per cent. of all children have these non-pathological systolic murmurs. In early childhood the systolic heart tones are especially distinct and separate, loud and sonorous, due to the comparatively larger heart mass and to the stronger and the more rapid heart contraction.

The writer divides these murmurs into exocardial or cardio-pulmonary murmurs and endocardial or the so-called functional or accidental murmurs. The cardio-pulmonary murmurs disappear in forcible expiration or when the breath is held in expiration, the endocardial are not influenced by respiration. These murmurs are never very loud or musical. The point of maximum intensity is usually over the insertion of the pulmonary artery. To the right of the sternum they are never found. The writer is of the opinion that accidental murmurs only very seldom occur in the first three years of life. In this view he is strongly opposed by Jacobi, Heubner and others. However, the author does not deny the frequent occurrence of cardio-pulmonary murmurs even in the first three years of life; he believes they are due to an assumption of a rhythmic sound by the lung which covers the heart and large vessels, by transmission from these structures. Therefore, these murmurs are due to a combination of vesicular respiratory sounds and to the pulsation of the heart and the great vessels. These murmurs often disappear in the course of examination, and in changing from standing to prone position, they are intensified by exertion and excitement. Schlieps found murmurs in 100 of 273 children which he examined. Of these, 63 were cardio-pulmonary.

The functional or accidental murmurs may be divided into those due to a stenosis of the origin of the great vessels (Lüthje, Goldscheider) and those due to an insufficiency of the valves brought about by lack of muscular tone (the atonic murmurs of Schlieps). The murmurs which arise in the course of any fever, he divides into "early murmurs," which disappear in the course of the fever and their origin is doubtful, and the "late murmurs," which are due to atonic condition of the heart muscle. These murmurs disappear when the general condition improves or when the peripheral pressure is raised.

The accidental murmurs occur most frequently in pale, nervous children between the ages of six and fourteen, and they are most frequently found during fever or in the states of mental exertion or bodily fatigue. One should diagnose these murmurs only when the blood pressure and percussion findings are normal, and when the murmurs are not influenced by respiration. Murmurs which disappear on exertion or excitement are never cardio-pulmonary murmurs. Those which become louder under these conditions may be such murmurs, but true accidental murmurs may be louder on exertion; only the "atonic murmurs" become weaker or disappear on exertion or excitement.

The accidental murmurs are to be differentiated from the organic murmurs by the absence of accentuation of second pulmonic and cardiac hypertrophy in the former, and by the intensification of the murmur, and by the appearance and disappearance of the murmur in different positions. Loud murmurs which replace the first sound are usually organic.

The writer also describes a murmur heard at times in marked rachitic chests, due to a compression of the pulmonary artery.

MARK S. REUBEN.

MARCHESINI, O.: FEVER FOLLOWING SCARLATINA. (*Boll. Sc. Mediche di Bologna*, 1912, No. 8.)

Frequently in cases of scarlet fever after the disappearance of rash and outside of any complications a slight temperature is observed for some time. This has been considered due to one of the following causes: Secondary streptococcic infection from tonsils, a reawakening of the disease itself, abnormal action of thermic centers disturbed by toxins, or, finally, permanence of causative agent of scarlet fever in some organ. Marchesini, however, is inclined to believe this elevation of temperature due to extreme sensibility of the organism to slight stimulation by toxins still present in the body.

C. D. MARTINETTI.

CASSEL, J.: KLINISCHER BEITRAG ZUR SAUGLINGSTUBERCULOSE. (CLINICAL OBSERVATIONS ON TUBERCULOSIS IN INFANCY.) (*Archiv. für Kinderhk.*, 1913, p. 131.)

Of 1,282 infants which the writer observed, 6 had active tuberculosis. Of a death total of 95 cases there were 6 deaths due to tuberculosis (6 per cent.). In 4 of these cases there was a family history of tuberculosis. These infants had fever, which lasted from three to twelve weeks. The characteristics of the fever are that it is remittent, and is much higher in the evening than in the morning. These cases showed no marked gastro-intestinal disturbances; the weight depends on the fever; in the febrile period there is loss of weight; in the afebrile period there is stationary weight, or even slight gain in weight. In spite of the fatal termination of the 6 cases of active tuberculosis in infancy, the writer believes that many infants who become infected with tuberculosis survive and grow up. There were no respiratory symptoms, and the bacillus of tuberculosis was not found in any of the cases. On autopsy, he found cavities in 2 of the cases; adhesive pleuritis is a frequent finding in these cases; empyema was found in 1 case; and the writer is of the opinion that it is not infrequently found in such infants; he was also able to find the tubercle bacillus in the fluid; this view is opposed to that of Hamburger, who believes that empyemas in infants are seldom or never tuberculous; the bronchial glands were involved in all 6 cases; there were other glands involved, pre-auricular, mesenteric, and in 2 cases ulcers of the intestine were found. The writer attaches great significance to the enlargement of pre-auricular glands; he believes that they nearly always imply tuberculous infection.

MARK S. REUBEN.

MYERS, BERNARD: TONGUE-CHEWING. (*The British Journal of Children's Diseases*, March, 1914, p. 111.)

Myers reports 4 cases of tongue chewing and comes to the following conclusions:—

(1) Tongue-chewing is first noticed about the second year of life and persists until middle age, or perhaps throughout life.

(2) It tends to be less noticeable with advancing years.

(3) Either sex may suffer from it.

(4) It occurs apparently in healthy families in which certain members suffer from habit-spasms.

(5) Several members of one family may suffer from it.

(6) The habit is inherited as far as one can see and not copied.

(7) The same side of the tongue is always chewed in the same individual.

(8) The mental condition is quite normal, and the general health is not interfered with in any way.

(9) Bromides stop the tongue-chewing, but in time, after leaving off the drug, the habit recommences.

JEROME S. LEOPOLD.

BATTEN, F. E., M.D., F.R.C.P.: UNUSUAL MANIFESTATIONS OF POLIOMYELITIS. (*The British Journal of Children's Diseases,* March, 1914.)

The following cases form a series illustrating some of the more unusual manifestations of poliomyelitis, the word "poliomyelitis" being used in its broadest sense to indicate an acute fever which may affect any part of the nervous system:—

(1) Athetosis of left arm and left side of face, flaccid paralysis of left leg, and some flaccid paralysis of right leg.

(2) Poliomyelitis with rigid extension of the legs at the hips.

(3) Poliomyelitis with flaccid palsy of the right arm and left leg, with rigidity of the right leg in the flexed position.

(4) Poliomyelitis of the right arm and left leg occurring during intrauterine life.

(5) Poliomyelitis and ataxia; probably due to cerebellar involvement.

(6) Poliomyelitis and toxic neuritis.

HAROLD R. MIXSELL, M.D.

CAMPIUS, R. MOLL: CASE OF NICOTINE POISONING. (*La Medicina de Los Niños,* January, 1914, p. 25.)

A boy twelve years old suddenly developed an abnormal taste for tobacco. He was soon smoking from ten to twenty cigars daily. Health began to suffer shortly, appetite disappeared, the boy became cross, disobedient and dazed. Reflexes diminished, sight was impaired, all movements became difficult. Tobacco was forbidden; rest, warm baths and massage soon removed all the symptoms of intoxication.

C. D. MARTINETTI.

ROBINSON, WILSE: SYPHILIS OF THE NERVOUS SYSTEM IN INFANCY, CHILDHOOD AND EARLY ADULT LIFE. (*Interstate Medical Journal,* November, 1913, p. 1,038.)

Lesions of the nervous system secondary to congenital or early acquired syphilis are of quite common occurrence. Those lesions secondary to syphilis which are acquired in infancy or early childhood do not differ in kind or degree from the lesions secondary to congenital syphilis. There may be evidence of gross lesions of the nervous system secondary to syphilis and yet be no obvious symptoms or signs of syphilis. By the aid of the

Wassermann test of the blood or spinal fluid and by a cytological and chemical examination of the spinal fluid, many obscure conditions may be demonstrated as secondary to syphilis in which syphilis may not be suspected and cannot be otherwise demonstrated. Hydrocephalus, meningitis, and convulsions in early infancy are very commonly secondary to syphilis. The so-called idiopathic type of general epilepsy is not an uncommon sequence of syphilis of the young. The Jacksonian type of epilepsy quite frequently occurs secondary to cortical lesions of syphilitic origin. Lesions of the spinal cord other than tabetic are unusual in syphilis of the young. States of mental defectiveness are very commonly caused by syphilis. Any lesions of the nervous system occurring in the young are serious. This is especially true of those lesions occurring secondary to syphilis. Some forms of meningitis, gummatous formations, epilepsy, pseudotabes and a few other conditions occasionally respond to treatment. Juvenile paresis and tabes do not yield to treatment. The treatment should be antisyphilitic and should be pushed to the limit.

T. WOOD CLARKE.

TASSINARI, BLANC: HOW TO DISCOVER AND COLLECT EGGS OF PARASITES IN FECES. (*Riv. d. Clin. Med.,* 1913, No. 6.)

The problem of how to collect eggs of parasites in feces is not a simple one. After trying various methods in order to avoid impairing the outer covering of the eggs the author recommends a 20 per cent. solution of antiformin. In many cases, however, Tebman's fluid (HCl and ether) is superior.

C. D. MARTINETTI.

LUCUS, WILLIAM P., M.D., AND OSGOOD, ROBERT B., M.D., BOSTON: TRANSMISSION EXPERIMENTS WITH THE VIRUS OF POLIOMYELITIS. (*Boston Medical Journal,* January.)

The transmission of the virus of poliomyelitis is reported by the authors. Inoculations with filtrates from the patient's nasal secretions prove the fact that the microörganism is active four months after his second attack and two years and three months after his first attack. Typical lesions of poliomyelitis were found in the spinal cord of the injected monkey.

HAROLD R. MIXSELL, M.D.

MITCHELL, A. PHILIP: THE INFECTION OF CHILDREN WITH THE BOVINE TUBERCLE BACILLUS. (*British Medical Journal*, January 17, 1914.)

Having investigated 72 consecutive cases of tuberculous cervical glands in children in Edinburgh and neighboring country districts, Dr. Mitchell makes the following deductions:—

Out of the 72 cases in 65 instances (90 per cent.) the bovine bacillus was present, and in 7 cases (10 per cent.) the human bacillus.

Children Five to Twelve Years of Age:—	
Human bacilli	4 cases
Bovine "	30 "
Children under Five Years of Age:—	
Human bacilli	3 "
Bovine "	35 "
Total	72 cases

With this striking picture of the danger of infection from milk of tuberculous cows he strongly advocates the sterilization of milk used for artificial feeding of infants and nourishment of all children whose milk is obtained from dairies where there is not a regular and adequate system of veterinary inspection.

Regarding the channels of infection, he considers "the faucial and pharyngeal tonsils not only the most frequent portals of entry for the tubercle bacillus in children, but in many instances they exhibit microscopic evidence of having been the primary focus of the tuberculous process."

E. T. WYMAN.

GRABOIS, G.: ETIOLOGY OF CHOREA. (*Thèse de Paris*, 1913.)

This thesis is a study of chorea based on 136 cases in the Paris Pediatric Clinic of Professor Hutinel. It is interesting to find this disease, hitherto considered a nervous affection, ascribed to a transitory meningoencephalic condition. It is principally found following cases of rheumatism, but also after measles, scarlet fever, mumps and other diseases. Three out of the 136 cases ended in death, which was caused respectively by typhoid infection, anemia and heart trouble.

C. D. MARTINETTI.

MARTINEZ-VARGAS, A.: TUBERCULOSIS OF THE HEART. (*La Med. de los Niños*, June, 1913.)

Martinez-Vargas considers four anatomic classes of cardiac tuberculosis in infancy:—

(1) Granular dissemination—similar to vegetating endocarditis—with no tubercles but frequent free baçilli.

(2) Isolated tubercles, either in the endocardium or in the myocardium itself.

(3) Sclerotic forms originated by toxins.

(4) Valvular lesions, as in a case cited by the author, of tricuspid valve covered with granulations.

The symptoms are not clear and frequently misleading because tubercular nodules seldom impair action of heart.

C. D. MARTINETTI.

COCKAYNE, E. A., D.M., M.R.C.P., ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO OUT-PATIENTS TO THE VICTORIA HOSPITAL FOR CHILDREN, CHELSEA: WHOOPING-COUGH IN THE FIRST DAYS OF LIFE. (*British Journal of Diseases of Children,* December, 1913.)

A few congenital cases of pertussis are mentioned by the author. These seem to have been transmitted "in utero" from the mother who had been exposed during the last of her pregnancy. The organism may be found in the circulation or may remain virulent in the placental tissues for nearly two months after the beginning of the illness.

The earliest age at which whooping-cough has been acquired was described by Bouchut in 1843. The infant began to cough four days after birth and whooped eight days after birth. In other cases reported the child coughed and whooped from eight to fifteen days after birth. The author's own case had a cough five days after birth and whooped ten days afterward. A blood-count taken showed characteristic leukocytosis with increase of lymphocytes.

In cases like these whooping may be entirely absent. Bronchitis is usually present, and except for the more paroxysmal nature of the cough there is little to distinguish it from the simple bronchitis so common at this age.

HAROLD R. MIXSELL, M.D.

BRUN, V.: MORPHIN IN PEDIATRIC SURGERY. (*Gaz. Osped. e Clin.*, April, 1912, No. 66.)

Up to a few years ago infants were supposed to always show intolerance toward any of the opium derivatives. Brun has studied the question and reports on 300 cases in which morphin was given as an adjunct to anesthesia. His conclusions are as follows:—

(1) Morphin and atropin administered thirty minutes before the anesthetic soothes the nerve centers, avoiding unnecessary struggles and excitement, also usually preventing retching.

(2) Morphin alone may be employed as a general anesthetic in small infants for operations around the head and is very well tolerated.

(3) Morphin and atropin are very effective as a postoperative sedative; two or three doses may be administered.

Brun saw no bad effects in any of his 300 cases and strongly advises others to try the above treatment.

C. D. MARTINETTI.

MACCONE, L.: ACUTE RETROPHARYNGEAL ABSCESS OF OTITIC ORIGIN IN INFANTS. (*Archiv. Ital. d. Otologia,* 1913, Vol. XXIV.)

These acute retropharyngeal abscesses in infancy are very rare. Surgical intervention is the only treatment effective at all. A large opening sufficient to drain the sac is advisable. This method Maccone considers superior to aspiration and to external opening.

C. D. MARTINETTI.

KER, CLAUDE B.: ISOLATION AND QUARANTINE PERIODS IN THE MORE COMMON INFECTIOUS DISEASES. (*Edinburgh Medical Journal,* January, 1914, p. 6.)

Ker discusses the isolation and quarantine periods in scarlet fever, diphtheria, measles, rubella, whooping-cough, chickenpox and mumps.

Scarlet Fever.—The normal minimum isolation recommended for this disease is six weeks—a period which may be either much too short or unnecessarily long, according to the condition of the individual case. The question of detention resolves itself into the question, Is desquamation infectious? a fact by no means proven. Priestley discharged from the hospital 120 desquamating children without causing a single secondary case. Others have adopted four instead of six weeks as the minimum period of detention in the hospital without increasing the return case rate. Ker believes that the adoption of five instead of six weeks as the minimum period of isolation would be a great step in advance. He considers seven days an ample period of quarantine for contacts.

Diphtheria.—Patients should be isolated until the necessary negative cultures have been obtained. Quarantine is unnecessary for perfectly well contacts who have given two successive negative cultures within three or four days.

Measles.—The usual isolation period for measles is two weeks from the appearance of the rash. In hospital outbreaks, however, measles patients are regarded as free from infection as soon as the rash has disappeared. The quarantine period of measles in hospital outbreaks is fifteen days; eight days may be regarded as a minimum, and nine or ten days more frequently from the probable moment of infection to the occurrence of the first symptom, and from thirteen to fifteen days to the appearance of the rash. Eberstaller at Graz allows contacts to attend school for eight days and closes the infected class from the ninth to the fourteenth day.

Rubella.—The period of detention for rubella is ten days. Netter and several other French authors, however, hold that a case is no longer infectious after the disappearance of the eruption. The incubation period is from twelve to twenty days. Contacts may safely attend school for eight or nine days after exposure and thereafter should be excluded until the twenty-first day is past.

Whooping-cough.—Ker has the gravest doubts as to the infectivity of whooping-cough when the paroxysmal stage has fully developed, and considers that, in favorable circumstances and with otherwise healthy children, isolation is unnecessary after the paroxysmal stage has lasted for a week or ten days.

Chicken-pox.—Ker believes a patient to be infectious until the last crust has separated. As regards quarantine, contacts are allowed to mix with other children up to the eleventh day, when they are isolated until the twenty-second. School attendance can safely be allowed for ten days from the first exposure, and be resumed after three weeks from the last contact with the patient.

Mumps.—The usual isolation period for mumps is three weeks, but Ker has never seen harm result from allowing patients out of isolation when a full week has elapsed after the disappearance of swelling. Exclusion of contacts from the thirteenth to the twenty-sixth day from the date of the first and last exposure respectively would be a safe rule for schools to adopt.

J. HERBERT YOUNG.

SURGERY.

LESPINASSE, V. D.: TREATMENT OF THE HEMORRHAGIC DISEASE OF THE NEWBORN BY DIRECT TRANSFUSION OF BLOOD. (*Journal of American Medical Association,* June 13, 1914, p. 1,866.)

Lespinasse states that the causes of the hemorrhage of the newborn are: syphilis, infection, hypoplasia of the coagulating elements of the blood and asphyxia. The pathologic findings are usually negative, except for the bleeding, although in a few cases the lesions of syphilis are found or a positive blood culture. The onset in the general run of cases is on the second to the fifth day, the earlier the more serious in prognosis. In luetic cases the onset is usually delayed until the seventh, or even the ninth, day. Death may take place within the first day after bleeding is noted. Of the author's 14 personal cases, in all of which transfusion was done, none died of hemorrhage. Two died of syphilis. All the others made perfect recoveries and are healthy, normal infants. They are not true bleeders and show no tendency to the trouble after the transfusion. Rather large amounts of blood are transfused by the author, but given slowly. The femoral vein is usually taken as offering the least technical difficulty.

CHARLES E. FARR.

DA COSTA, JOHN CHALMERS: THE CAUSAL RELATION OF TRAUMATISM TO TUBERCULOSIS. (*Annals of Surgery,* June, 1914, p. 909.)

Da Costa declares that, in his opinion, the pendulum has swung too far in the present general disbelief in the causation of tuberculous lesions by trauma. Up to within recent times the etiology of these lesions, especially in bones and joints, was commonly ascribed to injuries of slight extent or transient nature, but since the discovery of the tubercle bacillus by Koch the general consensus of opinion has gone to the opposite extreme. After indulging in a delightful vein of sarcasm at the expense of the lawyers, the courts, and even expert medical witnesses, the author proceeds to marshall with telling effect all the arguments, new and old, in favor of the traumatic localization of tuberculosis, even going so far as to claim that certain cases of pulmonary tuberculosis are due to injury. Syphilis, sarcoma and osteomyelitis, he claims, are generally conceded to be frequently localized by trauma, and, therefore, why not tuberculosis. Several examples are cited and numerous authors quoted in favor of his contention. On the whole this is the best and most convincing argument in recent literature on the subject. It must be confessed, however, that the logic is a little weak at times and that chief reliance must be placed in that very unreliable support, clinical observation. When one realizes how extremely difficult it is to arrive at even the approximate truth in any given case, however simple that case may seem, the mere heaping up of evidence of the same, or even weaker, nature in numbers of cases bears little weight. The question, as Da Costa says, is of great medico-legal importance. As such it deserves the most careful investigation.

CHARLES E. FARR.

DOWNES, WM. A.: PYLORIC OBSTRUCTION IN INFANTS. A REPORT OF 22 PERSONAL CASES WITH OPERATION. (*Journal of American Medical Association*, June 27, 1914, p. 2,019.)

This is a complete and detailed report of the author's personal experience with 22 operated cases of pyloric obstruction in infants in which a definite obstructive mass was found at the pylorus at operation. The paper must be read in full to obtain a just estimate of its extreme value in this rather rare condition. Only a few of the more salient facts will be given. Of the cases, 17 were males, 5 females; 18 were breast-fed entirely, 2 were bottle-fed, and 2 received mixed feeding. Symptoms appeared at from three days to seven weeks after birth, vomiting being the first symptom noted. This vomitus contains no bile. Constipation is a marked feature. X-ray examination is not so valuable as aspiration of the stomach contents. At the operation a hard, smooth tumor mass was found at the pylorus in each case. It consists of smooth muscle only, with a thickening of the mucosa by edema and infiltration. In all but one of the cases a typical posterior gastroenterostomy was done under ether, the incision being just to the left of the midline. Partial pyloroplasty after Weber was done in 1 case, but is reserved for cases demanding greater haste. Cases of spasm only should not in general be operated upon.

After-treatment is of the greatest importance. Brandy, atropin, caffein and hypodermoclysis are used to combat shock. Diluted breast milk is given alternately with water as soon as possible at hourly intervals. Colon irrigations or castor oil are used for the bowels.

Of the 22 cases, 7 died, 3 being in a state of collapse at the time of operation, 1 died from peritonitis, 1 from hemorrhage. The cause of death could not be determined in the other cases, even by autopsy. Two of the cases have died since leaving the hospital from causes not connected with the operation. Autopsy in each case showed the local condition to be all right, but the tumor mass persisting.

Downes warns particularly against too long-continued efforts at medical treatment. Once the diagnosis is established the case becomes surgical and should receive operative treatment without delay.

CHARLES E. FARR.

GREEN, R. M.: INTRACRANIAL HEMORRHAGE IN THE NEWBORN. (*Boston Medical and Surgical Journal,* April 30, 1914.)

Green declares that hemorrhage in the newborn may occur from trauma in a normal or operative delivery or from an associated hemorrhagic diathesis. The bleeding is usually subdural, but may be intraventricular. The diagnosis is not easy and is to be made only from a careful history of the delivery, the symptoms of hemorrhage, such as pallor, restlessness, etc., and finally pressure and focal symptoms. Lumbar puncture is of value for bleeding below the tentorium, both in diagnosis and in treatment, while for cortical hemorrhage cranial puncture should be used. Craniotomy is justified in resistant cases and should be preceded by a transfusion if the hemorrhagic diathesis is suspected. The source of the hemorrhage may be the vessels of the pia, the choroid plexus, the tentorium, or even the longitudinal sinus. Green has had 7 personal cases.

CHARLES E. FARR.

ARCHIVES OF PEDIATRICS

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EDITORIAL

INFANT MORTALITY.—TWO RESISTANT GROUPS.

The subject of infant mortality should be one of the greatest interest to all those engaged in the practice of pediatrics. Especially is this so at this time of the year in New York when the City Departments are planning their campaigns for the coming year and the financial authorities are passing upon their budgets. A great many thousand dollars are expended each year by the Division of Child Hygiene, the success of whose work may be, in part, judged by a comparison of the infant mortality statistics in recent years. Since 1910, at the end of which year the Division of Child Hygiene enlarged the scope of its work very materially—being able to carry on intensive work during the entire year—the mortality in the city as a whole has consistently decreased. In 1910 the rate was 125.6 per thousand births—in 1913, 101.9. The births reported during these years have increased only slightly, so that the reduction in rate cannot be laid to the larger figures here. Never before in the history of the city has there been such a steady and consistent fall in the death rate and the gross number of deaths under one year. The figures for the first eight months of 1913 show a corresponding and satisfactory decrease from those of the same period in previous years. Last year the rate was 105.6 for the first eight months as compared with 97.5 for this year. The chances are very good that, for the first time in its history, the death rate of babies under one year will be less than 100 per thousand births.

A more detailed investigation of these statistics, however, brings out some facts which are well worthy of consideration. The mortality in infancy may be roughly grouped under four headings—diarrheal diseases, "congenital debility," respiratory diseases, and miscellaneous. The first of these rough groups, with its marked sudden increase during the hot weather, has attracted attention for many years, and it was but natural that this should be the first point of attack. How successful have been the efforts to reduce this unnecessary mortality is well known. In the Borough of Manhattan, the figures for which are given because conditions of population, housing, etc., have remained more constant than in any of the other boroughs, the diarrheal death rate for the first eight months of the year has fallen from 34.6 in 1910 to 21.4 in 1914. The same conditions will be found to exist to almost the same degree in the other boroughs.

When, however, we come to the other two classes, we find a very different state of affairs. The deaths due to those causes vaguely classed as congenital debility and which, in a large proportion of cases, cause death during the first month of life, have remained practically constant all through this period. The great majority of all deaths under one month of age throughout the country and the world at large are set down to injury during labor and congenital debility. In the Borough of Manhattan in 1910 the rate was 39.1 per thousand for the first eight months of the year. In 1914 it is 36.1. In the intervening years there have been slight variations above or below these figures, but the fact remains that there has been almost no decrease in New York from these causes. The same facts may be easily obtained for other cities and towns throughout the United States. In England and Wales the official reports show a steady increase in the death rate from these conditions.

The ordinary methods which are in force have apparently been ineffectual in reducing this part of infant mortality. And when it is considered that these deaths are almost exclusively during the first month of life, it is not strange that it should be so. The causes must be looked for in conditions acting upon the child before its birth through the mother. The remedy must be applied before the birth of the child. Obviously the difficulties are many and, as far as the Health Department is concerned, with the best intentions in the world, it has been unable to devote a sufficient force of nurses and physicians to accomplish definite results without crippling the rest of its work. That it is possible, however, to save many of these lives has been conclusively proven. In Boston the work carried on by the committee of the Women's Municipal League has shown most excellent results. In St. Louis the work of the social service department of the Washington University Hospital has shown excellent results. In New York the New York Milk Committee during a period of two years cared for about three thousand women in the poorest parts of the city with a rate for stillbirths and deaths under one month of age from 25 to 35 per cent. lower than that in the Borough of Manhattan as a whole. The detailed reports of this work in different cities are available.

When will New York undertake to reduce this mortality among its babies? The Division of Child Hygiene is willing and anxious, but it is wisely confining itself to work which its forces are large enough to do well and until it can increase those forces, this work cannot be undertaken to any extent. It is, however, being done on a small scale at present by the Department. But there are other agencies in the city who might be rendering valuable services in this respect—namely, the maternity hospitals. The vast majority of women applying for admission to these hospitals receive almost no care or advice before labor. They do, of course, receive a thorough examination, but the constant advice and supervision which is given to women of the wealthier classes and which is considered essential for a safe pregnancy and a normal labor is not given. There are, of course, exceptions to this statement, but it would seem as if it was about time that the maternity hospitals undertook preventive measures as well as general hospitals. These measures are simple enough and require only the services of an intelligent nurse to visit the homes of prospective mothers and advise and instruct them in the simplest methods and details of the personal hygiene of pregnancy. This is at present being done in Baltimore and, to a certain extent, in Boston. Five years ago the deaths from diarrheal diseases and congenital debility were about the same. Simple educational methods have resulted in the diarrheal deaths today being about 60 per cent. of the congenital debility deaths.

The third group, the respiratory diseases, is a much more complicated and difficult problem. Here again we see almost a flat death rate. In 1910 in Manhattan it was 25.5. In 1913 it was 24.9. No method has been found for reducing this mortality. The diarrheal death rate is being controlled and reduced more and more each year. The causes of congenital debility are better known and methods have been successfully employed for reducing the mortality from this group of causes. It is only necessary for these methods to be largely employed to produce a real drop in this group of cases. The ingenuity, intelligence and interest of those interested in public health work as it affects infants is sorely needed to solve the problem of reducing the mortality from respiratory diseases.

FIRST HOSPITAL FOR CHILDREN.

It is not generally known that Charles Dickens was a benefactor to children in ways other than by his books. Charles Dickens was a great friend of West, the English pediatrist. During a number of years West had only a dispensary, where he could study children only under difficulties, not being able to study the more serious cases of illness and not having any autopsy material. West deplored this deeply and displayed great activity, and worked with unceasing zeal to found a special hospital for children, like those which were on the continent at this time.

Dickens interested himself in this building and contributed with West in the efforts to make the public realize the necessity of this institution. Thus he and West really were responsible for the founding of the first hospital for children in England—the London, in 1855. Thus the English children's specialists are in a great measure indebted to this great author for actual help in their science—*Boston Medical and Surgical Journal.*

ORIGINAL COMMUNICATIONS

SOME POINTS OF CONTACT BETWEEN TUBERCULOSIS WORK AND PEDIATRICS.

BY WILLIAM CHARLES WHITE, M.D.,

Associate Professor of Medicine, University of Pittsburgh; Medical Director, Tuberculosis League of Pittsburgh.

This is the golden day for the pediatrists when nearly all movements for social reform, public health and paternalism center themselves upon that period of human life over which this favored group of the medical profession have jurisdiction.

I do not know just what age limit the pediatrists put upon those who come under their supervision. The discussion on this subject is somewhat like the discussion carried on between the surgeons of different regions of the body as to just where the surgeon of one region leaves off and the surgeon of another region begins, but at whatever period of life the pediatrist takes up his work, the forbears of all the world contribute to the field of his labor, and no matter at what age he discharges the child from his care he delivers it to the fighting ranks of the world's populace. The pediatrist stands as the connecting link between the passing generations and generations of the future, and great power is in his hand to sway the course of evolution in modern preventive medicine, but in viewing the field there comes to me often the thought in Browning's verse, "Man is not man as yet. Nor shall I deem his object served, his end attained, his genuine strength put fairly forth, while only here and there a star dispels the darkness."

As examples of what I have mentioned in the first paragraph there are the interest of governments of all civilized countries in race suicide; societies for the study of antenatal hygiene in both male and female parent; societies for the paternal care of the child from the day of his birth for the prevention of infant mortality, for the promotion of child hygiene, for proper schooling conditions for the provision of extra food, for proper associations, for proper home and workshop conditions; besides, all the orphanages, all the hospitals, all the dispensaries, and the various agencies which have centered themselves upon the age period with which your society has to deal in this and other cities.

I come before you to-night, however, to discuss more especially the points of contact between the activities in the field of work which has to do with the prevention and cure of tuberculosis and your great field of child life which has to do with any arbitrary age period with which you care to limit it.

Before entering the details of my paper, I think it may be well to speak of the condition which you in common with all medical practitioners must face as part of the great problem of medicine of the future. This is more forcibly brought home to us in the past year by the battles which have gone on between the British Medical Association and the British Government; between the German Doctors' Union and the Government Insurance Companies; between the Dutch Doctors' Union and the Netherland Government; and, coming nearer home, the various organizations of doctors banding together just as various labor organizations band together to resist government and moneyed oppression.

I think we must all feel that without the revolution which has been present in the other countries we are steadily moving toward the period of medicine in which all people who so wish may insure themselves and their families against sickness and during illness will be cared for by officials of a paternal, federal, state and municipal government. It seems to me to be coming so rapidly that it is wise for medical educators and practitioners to fully appreciate the strength of the movement. Nothing is more striking in this present evolution period than the usurpation of control of various public health problems by voluntary organizations.

In time it seems to me the same thing will happen here as happened in England. When Lloyd George found his National Insurance Act was actually law and he had to deal with the parcelling out of his money for public health—the only organized state of affairs in any health problem was the voluntary organization which had to do with the care and prevention of tuberculosis. He consequently had to utilize and deal with this voluntary group of workers. And so it will come in the further growth of paternalism by governments that probably again and again these voluntary groups of people dealing with public health problems (the majority dealing with child problems), will come to be recognized and utilized by the various governmental powers in the future care of the human race; and it does seem to me wise, gentlemen, in realizing this fact, that you and I and all of us who boast of the name of physician should be in the front of this movement. It is much like the new Federal Banking System and the banks. One of the prominent bankers in the western end of the State said to me recently of the Federal Banking System, "It is bound to go, so our bank had better accept it and be in the forefront of the movement," and so it is with us; we had better be familiar with the development and growth of influences leading up to future conditions and lead the movement than attempt resistance. Such movements I believe are but parts of higher laws governing the evolution of the race.

Now let me detail some of the special ways in which the great organized international and national movements for the care and prevention of tuberculosis have invaded the childhood period and how definitely it seems necessary for tuberculosis organizations to assume labor in the childhood period in order to accomplish their purpose—the prevention of tuberculosis.

I need scarcely call your attention to the evidences of the postmortem table of the presence of tuberculosis in children dying from other chronic diseases in which from 16 to 25.9 per cent. were tuberculous. These figures are contained in the reports of the work of such men as Councilman, Baginsky, Heller, Hamburger and Ganghofer. The yet more delicate test of tuberculin, which is only positive when tubercle bacilli have gained entrance to the human body, has furnished more appalling figures, for as high as 94 per cent. of the children under fourteen years of age are shown by this means to have already become the seat of tuberculosis.

These figures seem to me more reliable than any figures offered by the various school physicians and hospital practitioners on the presence of tuberculosis from clinical examination, for, unless these clinical examinations have been verified by the finding of the tubercle bacillus, they carry little weight. We know that there are numerous pulmonary infections in childhood, chronic in character, similar to those described by your colleague, Dr. Stongel, which partake of the physical signs and symptoms of tuberculosis and are often diagnosed tuberculous, which have not the tubercle bacillus as a causative agent.

With so large a percentage of tuberculosis present in childhood it is surely one of the first things to think of in cases of doubtful diagnosis. It was a great pleasure to me to see, some months ago, the carrying out of this law of general suspicion in the new Harriet Lane Hospital by your eminent representative in the Johns Hopkins Hospital, Dr. Howland. Every child on admission is given a skin test, and if, perchance, it be positive, it is the foundation for a more especial search in this child for the presence of a clinical lesion of tuberculosis. I think it is an excellent law for all of us to follow—to utilize the skin test in children, much as we use our clinical thermometer to-day, and if the tuberculin skin test be positive let us be sure there is no gross lesion of tuberculosis before we finally exclude it. This might very well apply to all children who come under the care of physicians for indefinite symptoms of anemia, tiredness, lassitude, indigestion, poor sleep, cough and malnutrition.

I feel it is safe in this paper to neglect the cases of tuberculosis arising from the male and female parents during intrauterine life. If we do so, then the first great danger of infection to our children comes at birth and brings us through midwives in contact with obstetricians as well as pediatrists. The story reported by Reich in the *Berliner Klinische Wochenschrift*[1] illustrates this in a striking way: "In a town of about 1,300 inhabitants the obstetric practice was divided between two midwives. Within fourteen months no less than 10 infants, who had been delivered by one of these women, died of tuberculous meningitis. In none of these families was there a history of tuberculosis. This midwife was found to be suffering from pulmonary tuberculosis, and died from that disease. It was her custom to remove the mucus from the mouth of the newly-born infants by direct mouth-to-mouth aspiration, and then to establish respiration by blowing into the nose. In the practice of the other midwife, who was healthy, no cases of tuberculosis occurred, although she treated the newly-born infants in the same fashion."

This is probably an exaggerated instance, but it is certainly an instance of one thing which prepares the work of the pediatrist for him, and, further, is an instance of what he would willingly prevent if possible.

We are all certainly justified in demanding that the health of midwives be such as to warrant their being intrusted with the first week or two of life of our children.

Of course, the midwives may respond, What about the health of the obstetricians? The answer is a very complete one when we say that the obstetrician does not come in anything like the intimate relation with the child that the midwife does. That this is no small problem will be apparent to your mind when I tell you that out of the 15,050 children born in Greater Pittsburgh last year, 4,654 were delivered by midwives; that with the same proportion, which is probably a fair one for the rest of the State, there were no less than 58,900 children in the hands of midwives out of 190,000 births in the State.

The next point of contact comes in the first years of life of the child. One of the most important truths has lately been emphasized by the report of Dr. Hess from the ward of a large infant asylum in New York. In this institution the utmost care had been taken to control tuberculosis by segregation after giving to all children a tuberculin test and feeding them only on a pure pasteurized milk supply, containing no tubercle bacilli capable of producing tuberculosis, but, as so often happens, the greatest carelessness of all crept in—they failed to examine those who were to nurse and handle these so carefully-protected children, and a consumptive nurse was admitted to the ward, and all the children whom she nursed became tuberculous.

One cannot read this history by Hess without being impressed with the seriousness of this one of the great sources of the spread of tuberculosis in children. How careful we are in our private homes of our milk supply! how careful we are of the food we give our children; how persistent we are in our efforts to prevent the contacts that may cause scarlet fever, smallpox, measles, whooping-cough, etc.! and yet how every day we accept, especially south of Mason and Dixon's line, nurses for our children and servants into our households who spend from weeks to years working for us, but spend their last two years, or less, of life dying in a hospital for the care of consumptives. We have seen so many such cases that it seems to me the most serious problem in tuberculosis work. We neglect it as tuberculosis organizations and I am sure your members also neglect it. Many conditions excuse it, the most important of which is that the housework and nursing has to be done and the laborers are few.

In the South a great problem is presented by the negroes who nurse and work in homes in the daytime and go home at night. In this way the morning cough and sputum, so characteristic of consumption, escape the notice of the family with which the nurses work.

We talk so freely about the prevention of tuberculosis, and I know neither you, gentlemen, nor we who are specially interested in the tuberculosis problem, have begun to do our duty in being sure that in our own homes and in the homes of our patients those who care for our children cannot infect them with tuberculosis, or with other chronic illnesses, and I do not think we will begin to reach the root of this problem until this and similar activities have gained greater force, and I believe it is for your members first to begin the question of examination of nurse girls and nurses who are to be intrusted with the care of babies and children in our homes. I am sure that many of those of feeble constitution caused by tuberculosis take on the work of nursing because it is a lighter task and this may possibly be the explanation of our large mortality in the earlier years of life from this illness.

As another very serious feature in connection with early childhood in which the tuberculosis workers fight shoulder to shoulder with the various agencies dealing with child welfare and one of vital importance to all physicians dealing with childhood diseases, is the question of pure milk supply. It cannot be said to be more the province of one group of workers than of another; it is equally true that pure milk supply is fundamental in the protection against typhoid, in the protection against sore throat, in the protection against infantile diarrheal diseases, and probably in prevention of various forms of glandular and bone tuberculosis.

We are all equally interested in this great fundamental food of the childhood period. Of its relation to tuberculosis, one, of course, must be guarded in his statements with the present condition of the discussion on this subject. I cannot help but feel, however, that the day will come when a closer relation will be found to exist between pulmonary tuberculosis, due always to the human type of organism, and bovine tuberculosis of humans which has its seat in the lymph glands of the young child.

A very striking thing is that in tuberculous cases in childhood, glandular tuberculosis is by far the most prominent lesion, and of these glandular cases about 80 per cent. have mediastinal glands. While I do not care to go into the discussion, I lean myself to the belief of Von Behring and Hamburger, that we will find that the pulmonary lesions in later life are due to the rupture of smaller or larger lesions in mediastinal glands directly into some portion of the venous stream leading to the right heart and that the distribution from the right heart becomes localized in the pulmonary capillary stream. The localization is determined by the size and directness of the stream, perhaps altered by the position of the individual after the tubercle bacilli gain entrance to the blood. I am the more convinced of this after numerous experiments which we have carried on during the past year on the distribution of various fat-stained oils of light specific gravity, introduced into the blood stream of animals.

I think that it would be unfair of me not to mention here, even though my beliefs are what I have said, the other contention of the Italian Tuberculosis Commission, and of many others, that where bovine tuberculosis is abundant human tuberculosis is low in mortality; and where bovine tuberculosis is rare, because of the absence of cattle or of the non-use of milk for food, human tuberculosis mortality is high. I leave you to decide the point, for I cannot.

I can only say, in conclusion, on this point of contact it seems to me well for all of us to join our forces for the prevention of illness from the use of milk, and this I feel can only be gained by a carefully-supervised, muncipally-controlled, pasteurized milk supply.

In connection with the food supply to children there is a problem which often comes up for decision between the pediatrist, the obstetrician, and the general practitioner, as to whether the child shall be allowed to nurse from a tuberculous mother.

We naturally all agree that no food like the food of the mother has ever been obtained for the rearing of children, and we would like to have, of course, the very best children that can be raised. I feel sure that allowing the child the privilege of nursing from the mother cannot be laid down in any law, but is wholly an individual question. From our standpoint it involves many of the most intricate problems of immunity in tuberculosis. However, of this I am sure, that at no time should a child be allowed to nurse from a mother who has an active tuberculous lesion. The dangers in this case are not, I feel, so much that the child will become tuberculous from the mother's milk, but by the mother coughing over it. The most serious danger which I think must be accepted as positive is to the mother, who suffers very severely in the advance of her own tuberculous lesion during the lactation period. And yet even here, after watching many cases,I am not sure whether the relapse of the mother in many instances is not due more to the additional labor and strain necessitated by looking after the new child in the household in addition to the furnishing of milk than it is to the actual production of milk for the child. It is a point on which we need the help of such institutions as the Phipps Institute of your city and on which no one is able at the present time to give a complete answer.

The next point to which I wish to bring your attention is one about which so many misinterpretations have been made and into which so many carelessnesses have crept, and yet in which so many branches of the department of medicine are involved, that I almost hesitate to speak of it. I refer to the subject of tonsillectomy. I have for five years been closely associated with the various conditions surrounding this field. The mass of this work is done upon patients belonging to your age period of the human family and it forms a point of contact between pediatrists and tuberculosis work because of the frequent belief that the tonsils are not only a seat of frequent tuberculous infection and for this reason removed, but, also, because they are believed to a port of entry for the tubercle bacillus, leading even to the apices of the lungs.

I trust you will forgive me if I offer some criticism of our methods of handling patients in this field of work. The story of the tonsil as told by itself might be somewhat after this fashion:—

"I was born in my proper position; I responded to the various conditions of environment which enveloped me; I attempted to contribute to the immunity of the body between whose faucial pillars I resided. Sometimes my battle was pretty heavy and required me to enlarge, especially during the earlier years of life, but one day when my work was very heavy and I was pretty large, I was exposed with the aid of a tongue depressor to the gaze of the pediatrist. The mother of my possessor was standing by and the pediatrist turned to her and said, 'These tonsils are very much enlarged—they must come out.' After some conversation between the pediatrist and the mother, which seemed to me, knowing what tonsils are good for, to have no real knowledge as its foundation, the pediatrist called up the nose and throat surgeon and asked him to remove me on a certain day, which they arrived at jointly. The next time I was exposed to the light was when the nose and throat man's lamp glared at me in the operating room and my possessor was calmly sleeping under the influence of ether. I and my fellow were carefully cleared out of our resting place; a nurse was told to put us in a bottle and send us to the laboratory. We were placed in formaldehyd and left lying on the shelf for many years in company with tonsils from a very great many children of all nationalities. Finally, an energetic young physician, who had just received his diploma, stimulated by his chief, started in to study us by cutting our shriveled, dead bodies up with a very sharp knife and staining us so that we were quite unrecognizable to any but very expert eyes. His conclusions I have never seen, but my regret is that I was never understood; that my former possessor is long since forgotten; nobody knows that I ever belonged to him, or what relation I have to his body and his illnesses. There was no connection whatever between the various members of the medical profession who had a hand in taking me out and none of them seemed to care a rap whether I was valuable or useless. They never even discussed me in connection with the child to whom I belonged—because I was a little larger than I ought to be in the mind of the medical man, I was removed and then forgotten."

And so it is with much of the work with tonsils. I am sure many of them are taken out with the belief that they are either positively or potentially connected with tuberculosis, and yet one cannot read the careful publication of Dr. W. W. G. Maclachlan without being impressed with the small percentage (1.4 only) in which tuberculosis of the tonsils was present.

I would suggest a carefully-planned crusade on the part of any group of men interested in pediatrics to keep careful records of the cases in which the tonsils are removed (this is probably more possible in private families), and, also, to tabulate their results, so that we may know in the future whether the tonsillectomy which is so frequently done has any bearing upon future infection with tuberculosis and other sicknesses.

My time will not permit me to refer to the interesting studies of Weinberg in his very extensive monograph of last year on the question of increased mortality to other diseases among the children of tuberculous parents;[2] nor to the very interesting relation of so many diseases of childhood, such as measles, whooping-cough, influenza and typhoid fever as an underlying condition on which the tubercle bacillus builds its more virulent and fatal infections;[3] nor to the possible relation between tuberculosis and certain skin diseases, such as psoriasis, and certain diseases of the eye, especially phlyctenular conjunctivitis;[4] yet they are all subjects which form points of contact between your department and the modern field of tuberculosis.

I cannot refrain from calling your attention to one striking feature in the most interesting statistical studies of Mr. Frederick L. Hoffman, published last year in the *Journal of the Outdoor Life*"[5]:

COMPARATIVE MORTALITY FROM TUBERCULAR DISEASES, 1901-1911,
BY AGE AND SEX. UNITED STATES REGISTRATION STATES.
(RATES PER 100,0000 POPULATION.)

Age Period.	MALES.		FEMALES.	
	1901.	1911.	1901.	1911.
All ages { Crude rate ...	199.9	179.4	177.6	138.0
All ages { Corrected rate .	189.3	167.0	173.8	134.4
Under 5 years	147.7	133.3	128.6	120.0
5- 9 years	31.6	31.4	30.4	30.9
10-14 "	26.5	27.6	52.4	43.7
15-19 "	118.1	99.9	169.1	130.4
20-24 "	247.3	190.9	256.2	185.2
25-34 "	287.0	230.4	278.2	204.6
35-44 "	285.9	278.5	221.6	175.5
45-54 "	256.5	253.5	159.0	124.6
55-64 "	267.3	253.0	173.9	133.4
65-74 "	284.3	229.9	224.3	160.6
75 years and over	256.3	177.1	227.5	143.1
25 " " "				
Crude rate	277.7	249.1	223.7	168.1
Corrected rate ..	277.6	248.8	223.6	168.6

The interesting thing is that in ten years the mortality under five years of age has dropped in males only 14.4 per 100,000, and for females only 8.6. From five to nine years the death rate has not changed in ten years; and from ten to fourteen years has slightly increased for males, and for females has only dropped about 9 per 100,000. In the total fifteen-year period from birth (both sexes) the drop has been, you will see, 30.3 per 100,000, as compared with a drop of 83.8 in the general death rate from tuberculosis, a difference of 53.5 per 100,000 population. This is to me a very striking figure, outlining the necessity for the work of pediatrists as well as the increased labor on the part of tuberculosis organizations in the period of life governed by your body of medical profession.

In the later period of child life, from five to fifteen years, we reach what may be called the first of the quiescent periods of tuberculous infection. I do not feel justified in demanding your time to do more than merely mention such activities as open-air schools, school lunches, better home conditions, child labor, better workshops, all of which, while the tuberculosis organizations have taken part in them, belong no more to them than they do to the various other groups of workers who are interested in child life and health.

Some Difficulties of Contact.—Within the last three years the Tuberculosis League of Pittsburgh has been doing a great deal of work with children. Wanting to attempt an experiment in sixteen squares of the city on the childhood problem in its relation to tuberculosis, it appealed naturally first to the pediatrists, but had to make its way against lack of sympathy, against criticism and positive obstruction.

Wanting a little while later to utilize a tuberculosis dispensary during part of its idle hours for another experiment with children, the League found that it had to overcome an opposition again based upon ignorance, the result, probably, of its earlier educational efforts on this problem. Those who had the dispensary in charge raised the objection that we were exposing the children to tuberculosis by utilizing the building in which the tuberculosis clinic was held. Such danger of exposure of the patients, however, is not true to fact, as in a tuberculosis dispensary, carefully conducted, the exposure to infection is probably less than any place else.

I mention these difficulties in closing only to bring them again before you as subjects for thought. I know that there is much justness in the statement that every man is apt to think his task the most important, and this is probably said more often truly of the tuberculosis workers than of others; and yet it is because of the neglect of these problems by those to whom they naturally belong that makes the opportunity for others to take them up, and if I have been able in responding to what I consider a great honor—the privilege of addressing your Society—

to make us renew the question to ourselves, why we members of the various branches of the medical profession have allowed our interests to grow so widely apart, and as a result of this question, answered in each man's mind, we can draw a little more closely together in our common interests, as exemplified by your meeting of this evening, I shall remember this night as one of the most valuable I have spent.

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Acute Urticaria Treated with Epinephrin.—A. W. Swann reports a series of cases of acute urticaria and serum rashes (*Journal of American Medical Science,* March, 1913) in which the subcutaneous injection of a 1/1,000 adrenalin solution was followed by the disappearance of the erythema and wheals. In each case, a dose corresponding to 8 minims for a patient of 140 pounds was given. Two doses administered at intervals of ten minutes always sufficed to produce the desired results. Improvement was usually evident after seven to ten minutes; itching ceased in from five to twenty minutes after the first injection. In 5 out of the 6 cases, however, the rash and wheals reappeared in from one hour to three days. Swann suggests that epinephrin given hypodermically may be used to advantage in certain more serious, yet similar conditions, of which angioneurotic edema (of the epiglottis and larynx) is a type, and that when so used the drug may be the means of saving the patient's life. Another condition which may be influenced by epinephrin in a similar manner is the severe bronchial spasm and edema which occasionally occurs in cases of anaphylaxis. Swann observed such a case in which epinephrin was used, however, without much benefit. The possibility of differentiating rashes of purely vasomotor origin from those of other types by means of hypodermic injections of adrenalin also suggests itself.—*Universal Medical Record.*

ENDOCARDITIS IN CHILDREN.*

BY FLOYD M. CRANDALL, M.D.

It is not my purpose in this paper to present a systematic monograph on heart disease in children, but rather to record certain views reached after many years of observation. My first paper before this Society was a study of 142 cases of heart disease in children and was presented in 1891. It was based upon cases recorded by Dr. Holt at the Northwestern dispensary and others seen by me in his service at the New York Polyclinic. Since that time I have taken much interest in diseases of the rheumatic series, and hope that some of my experience is worthy of record. Last year Dr. Dunn read before this Society an admirable statistical paper based on 300 cases of heart disease seen in hospital practice. In reading that paper it seemed to me that one on the same subject from a different standpoint might be of some value. I am, therefore, presenting certain opinions, based not on statistics, but on personal experience. It is proper to say that these conclusions are not based on impressions and memory alone, which form a very uncertain basis for medical opinions, but upon a study of case histories of private patients, some of whom have been followed for many years. My general conclusion is that cardiac disease in private practice runs a considerably more favorable course than it does in hospital and dispensary practice. The reasons for this are obvious.

In selecting the title for this paper, I hesitated between using the term "carditis" or "endocarditis," but decided upon the latter. I am well aware that in the graver forms of heart disease which come to autopsy the disease is never limited to the endocardium alone. The pericardium and the myocardium are also involved. This was the experience of Sturges twenty or more years ago, and has been the constant experience of pathologists since that time. It is undoubtedly true that a certain amount of degeneration of the fibers of the heart muscle occurs during the course of every acute febrile disease or intoxication. This is frequently mild in degree, but myocarditis with little or no valvular involvement may cause the death of the patient, as in diphtheria. In watching the course of these cases, it is difficult to believe that in some of the less severe types, which run a favorable course, any marked degree of myocarditis or pericarditis is present. It certainly seems that a poison like that of rheumatism circulating in the blood may so irritate the sensitive myocardium as to cause the primary and essential lesion in that membrane, rendering the designation of endocarditis proper. The probability of grave myocarditis, however, must never be forgotten. Examinations for its detection should be frequent and careful, for upon it, more than any other element, depends the prognosis and much of the treatment.

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I have come to rely upon four symptoms as particularly suggestive of muscle involvement. The earliest to appear is irregular heart action or palpitation, and this is usually the most distinctive symptom. Syncope is characteristic of decided myocarditis, particularly in diphtheria. In addition to these two symptoms, cyanosis and precordial distress are very suggestive of muscle involvement. One or more of these symptoms in conjunction with physical signs warrants us in belief that in addition to the endocardial disease we have also muscle involvement. In the later stages the occurrence of cyanosis and edema is of more grave significance in the child than in the adult. They indicate a grave type of carditis, certainly endocardial and myocardial, and perhaps pericardial as well. It is usually impossible in a young child to determine the condition of the heart muscle, unless an examination can be made during sleep as well as during waking hours.

In determining the condition of the heart muscle, a blood examination may give assistance in addition to the aid usually expected of it. Palpitation and shortness of breath are such frequent accompaniments of anemia that it is helpful to ascertain the blood condition, and not always jump to the conclusion that the symptoms are wholly due to myocarditis. If the anemia is found to be marked, the prognosis may not be so gloomy, for its relief may directly mitigate the symptoms.

A point of great interest to me has been the occasional rapidity of the development of the physical signs of endocarditis. I have heard a loud endocardial murmur fully developed in a closely watched case within eighteen hours. It is not always the fact that a soft indefinite murmur precedes the development of distinctive sounds. Recognition of this fact would sometimes have saved criticism of practitioners by others who have been brought into the case and I think should be remembered before strictures are passed. It is quite possible that a distinctive blowing murmur may be present today that was not present yesterday. It is possible that the advent of fever with increased heart's action may sometimes aid in the apparent rapid development of endocardial lesions. It is a common statement in text-books that the severity of the case is not in proportion to the amount of sound heard on auscultation. There is truth in this statement if the case is judged by the amount of sound alone. If the murmurs are judged as they should be in connection with other signs, then the statement is not wholly true. Other things being equal, I find it hard to feel, when studying a case, that a loud rasping murmur is not more serious than a soft blowing one. I do not, of course, minimize the gravity of those faint blowing murmurs with irregular and uncertain heart's action, which accompany certain cases of myocarditis with but slight endocardial involvement, but I certainly do not prefer a loud rasping murmur to a faint one.

The final course of cardiac cases is always of great moment and interest. The patients in which the disease begins before twelve years have a very important period before them. The physician who ignores the gravity of a cardiac murmur and lightly says that the child will grow out of it, is taking almost a criminal risk. It is quite true that during this period of change some children do materially change for the better. I have during the past year seen two such satisfactory cases—one a boy and one a girl. A murmur had been left, following an acute endocarditis and I had concluded that in neither case was it likely to disappear. Much to my satisfaction, however, the murmurs have disappeared and the hearts give evidence of being in normal condition. The myocardium, it is true, had in both cases not been apparently involved at any time and the compensation had been excellent.

Results like this, however, are not often to be expected and should never be relied upon. The unfortunate opposite in my experience has been more frequently the result. Several children at this trying period have done badly and succumbed even without repetition of the acute endocarditis. On the whole, I should say, when a murmur has been left and the myocardium has been in fairly good condition, children have gone through this critical period without material changes in the cardiac condition. If they go to eighteen or twenty with a reasonably good cardiac muscle, they have a very good chance of going through the next three decades without cardiac symptoms. When the degenerative changes begin to appear, however, in later life, the individuals with impaired heart have not the chance possessed by normal subjects. They more readily succumb to acute disease and to arterial changes, and are not as apt to live to advanced age.

In general terms my experience leads me to agree with Dunn, that the earlier the primary endocarditis occurs the better is the ultimate prognosis, because of the more perfect adaptation of the child to the heart and the heart to the child. They grow up together and are more apt to adapt themselves to each other than they can do in later years.

In the matter of prognosis, I am not willing to agree with the proposition that the number of murmurs is not to be taken into consideration. The patient with a mitral regurgitant murmur alone, other things being equal, has a much better outlook than the one with a double mitral murmur, and vastly better than the one with an aortic murmur. An aortic lesion is a very dangerous thing in a child, but aortic insufficiency is fortunately rare in children. The human pump is like any other pump. A leak in a valve reduces its efficiency. If there is also obstruction to the flow of the fluid, the impairment is increased and two damaged valves are assuredly worse than one. This is a simple mechanical proposition which cannot be effaced by any amount of statistics. Two murmurs are more serious than one and three are more serious than two. There is too much tendency in statistical papers to make out tables based on one element alone. We cannot safely do that in practice. It is true that a heart with three murmurs and a good muscle may be found acting better than a heart with one murmur and a poor muscle. Prognosis based on one element alone will lead to error, and tables based on one element alone will lead equally to error.

The evil effects of anemia upon the child with cardiac disease can scarcely be overstated. It is a contributing factor to weakness and fatty degeneration of the heart muscle. If uncorrected it may be a factor in turning the scale against the child. This is true even of young children, and particularly true in the period after fourteen. The chlorotic type common to girls of that period should be watched for and should be vigorously combated by diet, moderate outdoor exercise and medication.

The sources of infection of acute rheumatism and the portals of entrance are still somewhat uncertain. The evidence against the tonsils, however, is very strong. The reasons for the removal of infected tonsils, therefore, in a rheumatic child, whether he have cardiac disease or not, are vastly greater than in any other constitutional type. The child with a cardiac lesion who is subject to tonsillitis should certainly have that dangerous portal of infection closed. In my experience, the type of tonsillitis marked by clear, white, pearly spots and a throat comparatively clean, has not been as serious as that type marked by a grayish exudate upon a soft, spongy-looking tonsil. Two of my patients a few years ago developed endocarditis in the same week with that type of throat. Cultures were taken primarily in the suspicion of diphtheria. No diphtheria bacilli were found, however, but quantities of streptococci. I have come to dread that soft, spongy type of throat with smeary exudate almost as much as an articular rheumatism.

The statement is so frequently made that quinsy is the type of sore throat most closely associated with rheumatism that there must be some truth in it. I have had in my practice many quinsy subjects and have watched them carefully, but can only say that I have been unable to demonstrate any relationship between quinsy and rheumatism, and certainly none between quinsy and heart disease.

The effect of endocarditis on the growth and development of a child has been a question of considerable interest to me. There are certain ones of the more grave cases, particularly those of decided rheumatic tendency with recurring attacks, which do not develop well. It has seemed to me, however, that the constitutional tendency of the child and its rheumatic involvement were often the factors more important than the heart lesions. I have seen child after child with distinctive blowing murmurs develop in a perfectly normal manner. I saw a little girl a few days ago who went through an acute endocarditis accompanying an inflamed ankle at six years, which left a loud, harsh murmur. She has done perfectly well, however, and began to menstruate at twelve years and five months. Now at thirteen years and four months the murmur is but slight; she is developed beyond the average girl of fourteen and is heavier and stronger than her twin brother, who is a perfectly sound boy. When the compensation is good there seems to be no reason why the child should not go on and develop in a normal manner.

The treatment of endocarditis divides itself into two very distinct stages—that of the acute and that of the chronic condition. I have become more and more impressed as the years have passed with the importance of absolute rest during the earlier stages. By rest I mean literally absolute rest in bed, that the heart may have as little labor to perform as possible. We treat a broken bone with absolute quiet and an inflamed eye by removal from the light. We can even put the ulcerated stomach at rest. With the heart, however, the rest must be comparative, but it should be as near perfect rest as we are able to attain. It is not sufficient to keep the child in bed during the febrile stage alone. Six weeks is the shortest time that any endocardial case can be safely permitted to leave the bed, and it is very rare that it is safe within two months. In fact, I would arbitrarily place the time at two months and beyond that be guided by symptoms. Two symptoms are of especial value in determining this important question of leaving the bed, namely, rapidity and regularity of the heart's action. I do not consent to the child's leaving the bed, whether it be six weeks or six months, until his pulse is well below 100, and is regular. Even then if it becomes irregular or unduly rapid upon moderate exertion I insist upon continuing the quiet. The rapidity on exertion, however, must be looked upon with some judgment. A child who has been several weeks in bed is certain to show rather more rapidity of pulse than one who has been leading an active life, and it is often a question how much importance should be attached to increased frequency of the pulse in the first efforts, if it continue regular. A child should be allowed to sit up in bed and engage in pastimes which will use the arms and involve some physical effort before he is allowed to actually leave the bed.

The management of the acute stage in ordinary cases has been with me a comparatively simple matter. The education of the family has often been more difficult than the treatment of the patient. But family training is necessary. In this particular I have frequently had the experience, especially in the chronic stages, that Dr. Dunn speaks about: the families are prone to go to one extreme or the other. They either ignore your advice and look upon the doctor as an alarmist, or they restrict the child unduly in safe and desirable activity.

After the child is out of bed with a murmur left behind and the chronic stage entered upon, many difficult problems present themselves. The management then often settles itself to one of judgment alone. Text-books give but little help as a rule, and the questions that arise must be decided largely by experience and reason. I am more and more convinced that to maintain the restrictive treatment too rigidly and too long after the preliminary stages is an error. Too much confinement to the house and restriction of muscular exercise may defeat its own object. We are now in a stage where nutrition should be maintained at its highest possible point; where muscular development should be encouraged, and the child prepared to perform its ordinary duties in life. The management of girls is usually easier in this regard than that of boys. Skipping the rope with little girls; dancing, lawn tennis and basket ball with the older ones are the exercises which are most likely to be productive of harm. With the boys who develop well and grow strong and athletic, the question of athletic games is a very difficult one, and I do not feel that general rules can be given. Here, as in the earlier stages, the rate and frequency of the pulse offers us the best guide, provided the patient is in a reasonably good physical condition. Action of the heart under exercise is the most reliable guide. If it becomes irregular or unduly rapid, there should be no hesitation in forbidding the more strenuous exercises.

A period of daily rest is of great importance to the cardiac child. This can usually be enforced more readily with girls than with boys. Even a half hour of relaxation during the day, whether the patient can sleep or not, is of great value. If that can be secured, we may feel warranted in granting considerably more leeway in the matter of actual exercise.

After the acute stages of endocarditis are passed, we have to deal with a condition rather than a disease. In the management of this condition, arbitrary rules may do harm rather than good. In few other conditions is it more essential that we study the case and treat the patient rather than the disease.

SPASMOPHILIA: A PARTIAL REVIEW OF THE LITERATURE.

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Spasmophilia, or tetany of childhood, is a symptom-complex depending on hyperirritability of the entire peripheral nervous system. The most characteristic symptoms of manifest spasmophilia are those referable to the motor nerves. They are: Laryngospasm, eclamptic seizures and tonic contractions of the extremities. In a typical case the hands are in the obstetrical position and the arms and legs are rigidly flexed on the body. In severe cases the tonic spasms also spread to the head and body, producing then a mask-like expression of the face, contracted mouth, wrinkling of the forehead, opisthotonos or emprosthotonos. At times there is retention of urine, difficulty in swallowing and fixity of the pupils. Trismus, strabismus and nystagmus may also be present.

On the part of the sympathetic nervous system, writers mention erythema, urticaria, hyperidrosis, peculiar swellings on the hands and feet, and alimentary disturbances, such as dilatation, cardiospasms, vomiting and diarrhea. The heart action is usually increased. Symptoms pointing to an involvement of the sensory nervous system are occasional paresthesias and pain in the extremities. The hyperirritability of the peripheral nervous system preceding or following manifest spasmophilia is spoken of as latent tetany. Its presence can be demonstrated by the following three cardinal signs:—

(1) Chvostek's sign. This is elicited by pressing or tapping over the trunk of the facial nerve or its divisions, producing lively contractions of the muscles which they innervate.

(2) Trousseau's sign is best produced by digital pressure in the occipital groove or by applying an elastic bandage and leaving it on for several minutes. It provokes a typical attack in that limb. This sign is usually considered pathognomonic.

(3) Erb's phenomenon, demonstrating directly the increased irritability of the peripheral nervous system by means of the galvanic and faradic currents.

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From their experiments Mann and Thiemich made the following generalizations regarding the nervous reactions to the galvanic currents in spasmophilic diathesis:—

(1) The values for K.C.C. are, as a rule, somewhat lower than in normal children.

(2) A.O.C. usually precedes A.C.C. (This is a rare occurrence in the normal.)

(3) The lowering of the values of K.O.C. is pathognomonic. They give the following values for the median nerves of children after the eighth week:—

Normal: K.C.C.—1.4 M.A., A.C.C.—2.2 M.A., A.O.C.—3.6 M.A., K.O.C.—8.2 M.A.

Spasmophilia: K.C.C.—0.7 M.A., A.C.C.—1.1 M.A., A.O.C. —0.9 M.A., K.O.C.—2.2. M.A.

Increase of the excitability for the faradic current is less constant.

Spasmophilic diathesis usually remains latent. If it does become manifest, it may be mild or severe. The most common symptom of manifest spasmophilia is the laryngospasm. If this occurs in a child, it should lead to further examination. The sequence is usually electrical hyperirritability, signs of latent tetany, laryngospasms, general eclamptic seizures and finally the obvious signs of manifest spasmophilia. The attacks may last minutes, hours or days. There may be only a single attack or they may recur at regular intervals. Spasmophilia occurs mainly between the third and twentieth month. After the third year spasmophilia resembles the tetany of adults more closely.

There are many theories regarding the etiology of spasmophilia. In general, however, they may be reduced to the two following groups:—

(1) Spasmophilic diathesis is due to calcium intoxication or to calcium deficiency.

(2) Spasmophilia is due to parathyroid insufficiency, which may be the cause of a disturbance of the intermediary metabolism.

First Group.—Acccording to the oldest theory formulated by Kassowitz, the symptoms of spasmophilia are the nervous manifestations of rachitis. This opinion he based on the good effect of phosphorus and cod-liver oil in both diseases.

Experience has shown that many symptoms of spasmophilia are dependent on the diet. By its means the symptoms can be modified, controlled, and at times entirely suppressed. The kind of diet, therefore, forms an important factor in the pathogenesis of spasmophilic diathesis. However, we do not know the cause of this effect on the diet. At the present time it is presumed to be some disturbance in the intermediary metabolism.

Gregor was the first to ascertain that all the symptoms of the disease, especially the galvanic irritability, stand in a definite relation to the diet. Finkelstein found galvanic hyperirritability in more than one-half of the lower classes. He also noticed that spasms occur especially when the babies are put on artificial food and that they disappear when put back on the breast, often within a few hours. Rehn and Flesch, Gregor, Thiemich and Tapha made the same observations.

It was found that the symptoms of spasmophilia depend also on the quantity of the food; for the richer the diet, the more pronounced the symptoms. They can often be entirely suppressed by cathartics, water, a tea diet or a complete fast. When this procedure is not effective even the return to the natural diet does not accomplish much.

Besides mother's milk, various artificial diets have an influence on spasmophilia. Cow's milk is most dangerous. In two of Finkelstein's cases sudden death occurred from spasm of the glottis when the babies had been put back on cow's milk. Sugar, butter and fats in general have no influence on spasmophilia. Finkelstein, therefore, thought that some constituent of the diet was the true cause of the nervous hyperirritability, but since severe spasmophilia cannot be influenced by the diet there must be other factors. Finkelstein studied the influence of separate constituents of artificial feedings by adding casein of cow's milk, fat and sugar to the mother's milk of the spasmophilic child. However, he obtained no results. But when the whey of cow's milk was added, the irritability increased just as if the baby had again been put on cow's milk. Therefore, Finkelstein reached the view that the underlying cause of tetany is a special form of disturbance of the intermediary metabolism. Since there is five times as much calcium in cow's milk as in mother's milk, he naturally thought of the influence of calcium. He tested this, but obtained no uniform results in the 2 cases that he worked with. Owing to the fact that phosphorus seems to exert a specific influence in spasmophilia and also that spasmophilic diathesis is often coupled with rachitis, Finkelstein thought that there might be a derangement of phosphorus or calcium metabolism, the osseous and nervous system being both rich in phosphorus and calcium.

Stoelzner worked along the same line. He fed the different constituents of the whey of cow's milk to spasmophilic children in order to ascertain the causative agent. In his experiments he emptied the bowels and gave a milk-free diet in order to produce a normal electrical reaction. After the children had received some of the substances of the ash, he ascertained the number of milliamperes necessary to produce a contraction of the flexors of the fingers on cathodal closing. He also tested for Trousseau's and Chvostek's sign. He fed ferrum lacticum, potassium acetate, sodium chlorate, sodium phosphate and magnesia usta without obtaining any increase in the electrical irritability. But when he gave a dram of a 3 per cent. solution of calcium acetate every three hours he found an increase in the irritability. Of the 6 children suffering from spasmophilia, 3 showed a definite increase. The other 3, however, gave less satisfactory results. In two non-spasmophilic children no increase of irritability occurred even when calcium was given. From these experiments, Stoelzner concludes that the influence of cow's milk on spasmophilia lies in a calcium intoxication.

His theory of how this poisoning is brought about is rather interesting. He thinks that the absorbed calcium is not used by the organism and is again excreted through the intestinal mucosa. When cow's milk is given much more calcium is taken up than would be the case if the infant obtained its natural food. Consequently increased demands are made on the intestinal mucosa. These demands are even greater when the child is simultaneously suffering from rickets. In the normal child the greater part of the calcium is retained by the osseous system, but in rickets the whole of the absorbed calcium is again eliminated, and even some formed bone is broken down and its calcium excreted. Extraordinary demands are, therefore, made on the excretory functions of the intestinal mucosa; it finally becomes insufficient and there naturally results a calcium retention, which leads to intoxication of the organism with calcium.

Stoelzner's theory has been attacked by many authors, among them Weigert, von Pirquet, Bogen and Risel. There are a number of experiments that seem to prove that there is no calcium accumulation in spasmophilia. According to Cybulski, the retention of calcium is least during the sickness and increases with approaching health. Sabbatini, Regoli and Roncorni found that the application of calcium solution to the motor cortex lowers the irritability and that the withdrawal of calcium by means of sodium oxalate increases the irritability until finally general convulsions occur. Led by these researches Quest examined the calcium contents of the brain of 7 normal and 3 spasmophilic children. Assuming the nitrogen content of the brain to be normal, he expressed the calcium content of the brain by the fraction N/Ca In 2 spasmophilic children, ages ten and eleven months, N/Ca equalled 240 and 269. In a normal twelve months child N/Ca equalled 164.

Owing to the small numbers, Quest does not draw any definite conclusions as regards the hyperirritability of the nervous system due to the administration of calcium in the newborn. He states as proved that the calcium content of the newborn is relatively higher and that subsequently it diminishes, at first quickly and later more slowly. He is less sure, owing to the number of experiments, that the brains of tetanic children in comparison with non-tetanic children show a markedly diminished calcium content. Quest's finding is supported by Silvestri, but not by Leopold and Reuss, who carried out their investigation after Sylvestri.

In newborn dogs living on a calcium-poor diet, Quest was able to prove an increased irritability of the peripheral nerves. In contrast to Stoelzner's theory he proved that an experimentally-produced calcium accumulation does not provoke a greater irritability of the peripheral nerves. Weigert also found that the brain of a dog dying in spasms contained 0.125 per cent. calcium oxide, while that of the control animal had 0.158 per cent. of calcium oxide. The discussion between Stoelzner and Quest has not been decided up to the present time, for Stoelzner has been unable, even after he had fed dogs on a calcium-poor diet for twelve weeks, to demonstrate any difference in the irritability.

Von Pirquet investigated the etiology of spasmophilia with reference to cow's milk, testing for galvanic irritability. He found that in a number of apparently healthy children, symptoms of hyperirritability were present, but in no instance did the transition from mother's milk to cow's milk cause a manifest increase of irritability. He, therefore, thinks that there is no direct relation of tetanoid conditions to cow's milk. Von Pirquet concludes consequently that Stoelzner's theory is improbable, since the irritability continued when children were receiving the least calcium, and disappeared when the calcium content of the food was markedly increased. He found also that the giving of large amounts of calcium did not hurt the child.

Bogen points out that there are some cases of spasmophilia that are not influenced by a carbohydrate diet. The fact that even after previous starvation the irritability increases when carbohydrates are added, he thinks renders all conclusions of Stoelzner's calcium experiments invalid. He also found that the giving of calcium does not produce tetanoid conditions.

Thiemich does not agree with Finkelstein that the noxious effects of the diet on spasmophilic children is to be sought only in cow's milk. Clinical experience is against this, for spasmophilia sometimes occurs even in breast-fed infants. Though these are exceptional cases they prove that the diet is not the only factor involved. Finkelstein himself recognizes this, for he differentiates two groups of children. In the first group he puts the well-nourished, the fat and the over-fed children. In them spasmophilia disappears when the diet is changed or reduced. In the second group he places the thin, emaciated children, who are usually suffering from chronic gastrointestinal catarrh. In these cases even a strict diet has no effect. Finkelstein also calls attention to the hereditary factor. He suggests that children who develop spasmophilia after the slightest nutritional disturbance are descended from mothers who, themselves, suffered from spasmophilia in childhood. He finds that some of the mothers actually show evident signs of latent tetany.

In addition to heredity, Thiemich cites other physiologic factors, such as long-continued illnesses which lead to cachexia, disturbances of respiration and poor ventilation of the blood, rises in temperature and fever. Thiemich thinks that the disturbance of respiration is the main factor in the production of laryngospasm and eclampsia. This is borne out by the well-known observations that laryngospasm and eclampsia are produced by reflex stopping of respiration and long-continued crying. An overfilled stomach may act similarly.

Thiemich thinks that in spasmophilia we are dealing with some change in metabolism the nature of which we know nothing. Since physiologic experiments have shown that osmotically active salt solutions have an effect on the irritability of the peripheral nerves, it may be that we are dealing with a disturbance of the salt metabolism.

Aschenheim investigated not only the calcium, but also the other important salts. He found a diminution of the alkalin earth and an increase in the alkalies in the ash of four brains of spasmophilic children. In one case he obtained a surprisingly high value for potassium. According to Aschenheim, it is not the calcium content, but rather the quotient of alkalies divided by the alkalin earth which determines the behavior of the nervous irritability in tetany. In the same way J. Loeb designated the irritability of nerve and muscle as a function of the quotient NA/CA. According to Reiss, Li and Na act as excitants; Mg, Ca, NH_4 and K as depressants.

Concerning the part which the alkalies play in the production of the spasmophilic symptom-complex we know but little at present. Nevertheless there are in the literature a few rather remarkable observations. MacCallum and Vögtlin observed that K can aggravate the symptoms of experimentally produced tetany. Correspondingly Zybell was able to produce by a single dose of 3 grams of potassium acetate in spasmophilic children an increase of irritability at the anode and cathode of one-half to one MA lasting several hours. By continued administration a distinct aggravation of the sickness could be produced. Rosenstern saw a similar effect after the administration of sodium chlorid; 100 c.c. of a 3 per cent. sodium chlorid solution led with fever to an increase of AOC, while KOC was only little increased. Children who had gotten over the laryngospasm again had attacks if they received 6 to 8 grams of sodium chlorid. Lust finally mentions a case of a two-year-old girl in whom with the appearance of edema there occurred simultaneously manifest symptoms of tetany which had not been observed previously; these disappeared again when the edema became less. Since in these cases there is a sodium chlorid retention, the connection of the alkalies with the spasmophilic symptom-complex seems possible.

Second Group of Theories.—The second hypothesis of tetany and of spasmophilia depends upon the fact that in the case of dogs tetany may be produced experimentally by extirpation of the parathyroids. Even in the case of man similar thyreoprival tetany has been noticed after goiter extirpation when the parathyroids were not saved. Not all authors, however, agree on this subject. Erdheim's experiments on rats show that after complete parathyroidectomy tetany occurs, and that the animals usually die from inanition within two to five months. When the results are not so marked, it was usually found that some accessory parathyroids had not been removed. Gley and Moussu, Vassale and Generali, also Welsh, Biedl, Chvostek, Pineles, Erdheim, Pfeiffer and Mäyer attempted to show that experimental parathyroid tetany is identical with postoperative human tetany and also with spontaneous tetany in man. They maintain that tetany in man is referable to a disturbance in the function or to the non-function of the parathyroids. Pineles sees the proof of the identity especially in the correspondence of the clinical symptoms. He mentions fibrillary twitchings, typical of tetanic intention tremors, spasms, mechanical and electrical hyperirritability of the motorium; Trousseau's phenomenon, trophic disturbances of the hair, teeth and nails, opacities of the lens, etc. In both conditions severe attacks are followed by normal periods; Trousseau's sign comes and goes in experimental thyroid tetany just as in normal tetany; in both there may appear paralysis, contractures and intention tremors. There have also been observed symptoms that are analogous to the tetany of pregnancy.

Spasmophilia has in common with other forms of tetany occurring in man the most important symptom of galvanic hyperirritability as well as Chvostek and Trousseau's signs. The changes in muscular contractions also are the same in tetany and spasmophilia as shown by Mann and Thiemich on the one hand and by Westphal, Bernhardt, Frankl-Hochwart, Hoffman and Pineles on the other. Pineles concludes that it has been proven by numerous experiments depending on the extirpation of the parathyroids and by clinical observations that the post-operative human tetany is caused by the removal of the parathyroids. He maintains that all kinds of human tetany, including spasmophilia, are identical in their nature. Since the clinical picture shows a complete correspondence between human and experimental tetany, he thinks that spasmophilia is due to insufficiency of the parathyroids.

Chvostek believes that no objection can be made to the arguments of Pineles. Most pediatricians, however, are rather opposed to this theory. Thiemich has attacked it. He considers it as a mere hypothesis unsupported by any pathologic or anatomic findings. He himself made anatomic examinations of 3 spasmophilic children and also 5 others that had no spasmophilic symptoms. The result of the histologic examinations were entirely negative. He found no difference between the microscopic picture of the parathyroids of spasmophilic and of normal children. There were no inflammatory or degenerative changes. He concludes, therefore, that the pathogenesis of spasmophilia is to be sought in other factors than in a disturbance of the functions of the parathyroids.

Since milk diet is injurious in spasmophilia, but favorable in experimental tetany of dogs, Stoelzner concludes that spasmophilia and experimental tetany are entirely different conditions. Pineles feels that the pediatricians are too anxious to find things that prove the dependency of tetany on the diet. He maintains that the cases of Thiemich are too few to permit the drawing of conclusions. He also thinks that no satisfactory conclusions can be drawn from the effect of the diet in man and in dogs.

Erdheim was the first to describe hemorrhages into the parathyroids. He found them in 8 cases, 7 of which were between one and thirteen. In children the hemorrhages were most recent, especially in the newborn that had died of asphyxia. The older the cases, the more absorption and healing had taken place. He thinks that they may all have been caused by asphyxia during birth. Peterson, Schmorl, Koenigstein, Pepere, Getz and Manasse also observed such hemorrhages into the parathyroids.

Manasse made the most complete observations. He examined 89 children coming to autopsy without special selection, the ages varying between birth and fifteen years. He found hemorrhages or their residuals in 33. The youngest was three days old, the oldest that showed residuals was five; beyond that age he found none. He, therefore, agrees with Erdheim that hemorrhages occur during the first days of life, probably as the result of asphyxia at birth. Erdheim succeeded in finding hemorrhages in 3 cases that had died of tetany. On the basis of the pathologic and anatomic findings, he concludes that the etiology of tetany consists in a disturbed or lowered function of the parathyroids.

Manasse made numerous systematic observations in this direction. He determined the electrical irritability in sick children and on their exitus examined the parathyroids. Fifty children came to autopsy, 13 showed during life a normal electrical reaction. Their parathyroids were absolutely normal. On the other hand, of the 22 cases that had shown an increase of electrical irritability, 12 had hemorrhages, that is, 54.5 per cent. They were not absent in any of the 9 cases under one year of age. In the remaining 13 older than one year only 3 showed rests of hemorrhages. From this Manasse concludes that the other 10 negative cases had probably shown hemorrhages once, but that in the meantime they had become absorbed. Furthermore, in children with increased cathodal irritability, he found hemorrhages in the parathyroids. Manasse realizes that even this number of spasmophilic children is insufficient to determine absolutely the question whether the origin of tetany is to be sought in the hemorrhages in the parathyroids. He believes that in manifest tetany hemorrhages are probably always to be found and that they are the result of some trauma during birth. They interfere with the function of the parathyroids, which he thinks may consist in a neutralization of certain poisons in the organism. Through this injury there is produced a tendency to spasmophilia.

Koenigstein also examined the parathyroids anatomically. He did not find any hemorrhages of residuals, but he thought that he found certain changes deviating from the normal. He found more glycogen in a nine months baby than in an adult suffering from tetany. However, Guizetti found more glycogen in children generally than in adults.

According to Haberfeldt, spasmophilia is not caused by traumatism of the parathyroids during birth, but rather by subsequent disturbance of their function. Among the more recent investigations, the findings of Koplik, Triboulet and Harviet support this hypothesis; in accord with this are also the findings of Jovane and Vaglio. However, the investigations of Auerbach showed that in the case of two-thirds of the children with normal irritability, traces of hemorrhages can be demonstrated in the parathyroids. Therefore, the connection between the parathyreo-prival tetany and spasmophilia of infants cannot be considered as completely proven. Grosser, Betke and Oppenheimer come to this same conclusion. On the basis of histologic examination, Bliss, Jorgensen and Schiffer deny that there is any connection between spasmophilia and the congenital changes of the parathyroids. MacCallum and Vögtlin demonstrated that in dogs the parathyroids of which have been extirpated, the calcium content of the brain and blood is diminished. In normal dogs it is 0.0122 per cent. of calcium; in tetany dogs 0.0053 per cent. However, the observation of Neurath does not agree with this.

He observed that the calcium combinations of the blood which are precipitable with oxalates are increased in the case of spasmophilic children. Cooke found a diminution of the calcium content of the brain of tetanic children. According to his view there is a disturbance not only in the calcium, but also in the magnesium metabolism. He thinks that acid substances accumulate in the intermediary metabolism and that these are neutralized under normal conditions by the action of the parathyroids. In case their function is not sufficient the organism employs calcium and magnesium for the purpose of neutralization. According to Cooke, tetany is, therefore, due to an insufficiency of calcium and magnesium. Similar are the views of MacCallum and Vögtlin. They found that in thyreo-prival tetany there is a reduction of calcium in the blood, in the brain and in the spinal cord. They think that the parathyroids exert a control over the calcium metabolism. A reduced assimilation and an increased excretion of calcium leads to a poverty of calcium and, therefore, to over-irritability. They call tetany directly calcium diabetes. According to recent investigations, it seems that severe metabolic disturbances of parathyreo-prival animals manifest themselves in acidosis. For the neutralization of the acids formed in the intermediary metabolism, ammonia is utilized by the organism. At present the connection between spasmophilia and insufficient functioning of the parathyroids cannot be considered as proved.

Kassowitz thinks that the explanation of human tetany necessitates the theory that special spasmodic centers are irritated by toxic substances of various origin not neutralized by the secretion of the parathyroids. Frommer explains eclampsia in the same way. From animal experimentation he maintains that the parathyroids have an antitoxic action and that they neutralize the toxic products of the placenta. He thinks that in spasmophilia the toxic products are of exogenous origin.

Investigations have shown that a connection of the ganglion cells of the spinal cord with the higher situated centers is not necessary in order to obtain the increased irritability in spasmophilia or tetany. Munk reported that after cutting the spinal cord the spasms of the paralyzed posterior extremities continued. Horsley and Lanz have demonstrated that after extirpation of the cortico-motor centers of one side, the tetany persisted on the opposite side of the body. Falta's examination showed that after cutting the spinal cord of tetanic animals, the galvanic hyperirritability continued in the paralyzed extremities until death. He thinks, therefore, that the same cause of tetany lies in the changes of the ganglion cells of the spinal cord and not in the higher centers as MacCallum and Biedl believe. He does not maintain, however, that the higher centers may not also be in a condition of hyperirritability. The abnormal tension in the ganglion cells may lead spontaneously or through some exciting cause to an increased irritability and to tetanic spasms. By this means there is always present a hyperirritability even after the attack. Falta and Rüdinger believe that a hormone is secreted by the parathyroids which produces a check in the ganglion cells. The diminution or absence of this hormone leads to an abnormal loading of the cells with energy. Nothing definite, however, is known about this hormone activity. MacCallum and Vögtlin also think that the parathyroids secrete a hormone, but they believe that it influences the calcium metabolism in the central nervous system. Through the disappearance of this hormone there is produced a diminution of calcium in the ganglion cells and consequent hyperirritability.

Falta and Kahn found that during the acute stages of tetany the ammonia output in the urine is relatively and absolutely increased. MacCallum and Vögtlin proved that in the parathyroidectomized dogs the proteid metabolism is increased, and that ammonia and creatinin are present in large amounts in the urine. Koch found toxic bases in the urine of animals after parathyroidectomy. His experiments seem to show that digested proteins taken into the body have toxic effects after the removal of the parathyroids. These effects, he thinks, are due to products of the intestinal and perhaps also parenteral digestion. Such products are normally placed in some cell molecule or stored up in some form. In the case of these animals they are free and act as toxins. In other animals where no feeding occurred, the symptoms probably followed the disintegration of the body protein. The pathologic condition would thus appear to be a failure on the part of the cells to build up their protein. He thinks the parathyroid action is concerned with anabolic processes closely related with the building up of nucleins. Some of his reasons for this conclusion are as follows: the anabolic metabolism of the cell is regarded as a function of the nucleus. The formation of free nuclein elements points to a nuclein atrophy. Histologic findings actually show an active nuclear degeneration. The extensive coagulation of blood coming from organs rich in cells and nuclei indicates the presence of free nucleic acid in the circulation, since nucleic acid coagulates blood plasma in acid solution. The acidity of the blood is indicated by the absence of iron in the erythrocytes of the blood coming from such organs as well as by the presence of small proportions of erythrocytes that stain intensely with eosin.

In his more recent experiments on animals MacCallum found that the peripheral part of a neuron may be over-irritated when it is washed with tetanic blood, while the central part remains in its normal condition. The nerve endings seem to be particularly affected, for variations in the irritability of the muscles to direct stimuli are not evident. He believes that this hyperirritability is produced by changes in the composition of the circulating blood. This may consist in the presence of a definite circulating toxin which may become active through the withdrawal of calcium; for subsequent to the perfusion with oxalated blood, effects may be produced similar to those which follow the perfusion with tetanic blood. When a normal leg is perfused with the blood of a tetanic animal there occurs characteristic hyperirritability. The addition of parathyroid extract has apparently no influence on the hyperirritability. The tetany, however, is influenced very favorably and at times stopped. The effect of the extract is, therefore, similar to that of a narcotic. MacCallum and Vogel found that tetany may be caused to disappear by bleeding the animal and by substituting for the blood an indifferent calcium-free solution. In case of slow and often repeated injections of oxalates there occurs a pronounced hyperirritability of the nerves. They also found that the blood of a tetanic animal shows a distinctly diminished calcium content, but that in the case of incomplete removal of the parathyroids not leading to tetany the calcium content of the blood is normal.

Summary.—From the foregoing it is evident that at present there is no unanimity of opinion. The majority of workers seem to favor the view that there is a disturbance in the intermediary salt—especially the calcium-metabolism which may be due to an insufficient functioning of the parathyroids.

TREATMENT.

Most authors recommend that the spasmophilic infant be put on mother's milk if possible or that a wet nurse be secured. In a large number of cases this measure is sufficient to cause disappearance of symptoms. When gastrointestinal disturbances are present it is best to discontinue all food for twenty-four hours and put the child on a tea diet. If severe laryngospasms and eclamptic conditions are present it is advisable to evacuate the bowels with 5 or 10 c.c. of ol. ricini. After the twenty-four-hour water or tea diet it is usually best to start with 5 per cent. gruels, to which 3 to 5 per cent. of lactose is added. After three to seven days the caloric value of the food may be increased by adding precipitated and washed casein and fat. As soon as possible milk should be slowly added. Though relapses are to be feared, yet a carbohydrate diet poor in salt lasting longer than eight days has also its dangers in infancy, especially if there occurs loss in weight, subnormal temperature and collapse. Nothing is surer to prevent the appearance of spasmophilia than nursing the breast. If bottle feeding has to be resorted to, it should be done with limited amounts of milk, that is, ¾ of a liter or at most 1 liter per day in order to avoid the dangers of laryngospasms and eclamptic seizures as much as possible.

Netter recommends calcium chlorid as a drug for tetany. He uses 2 grams with prompt results in spasms of babies. Larger doses act even better. Rosen and others recommend phosphorus and cod-liver oil in the proportion of 0.01 to 100. According to Schabad this gradually leads to increased calcium retention. L. F. Meyer has seen good effects from large doses of calcium bromide in cases of laryngospasm. He gave 2 to 3 drams per day. Quest drew no conclusions for treatment from his experiments. He thinks that the calcium metabolism is not sufficiently known in man and that much depends on the form in which calcium is given. Other minerals and organic constituents are probably important in the retention of calcium. For this speaks the favorable results obtained by the change of diet and by giving phosphorus. Finkelstein thinks that phosphorus is an antispasmodic, but its effects are not remarkable and not pronounced without change of diet. It is possible that the phosphorus produces a favorable effect on the calcium metabolism.

With children over a year, milk can be dropped for a week without harm. In all cases of spasmophilia, cod-liver oil or phosphorus and cod-liver oil is indicated. On this alone, in many cases, without any change in the diet, the symptoms of spasmophilia will disappear. Phosphorus with other oils is ineffectual. The phosphorus must be fresh and renewed every two weeks at least, as it is said to have no action if oxidized. Only elementary phosphorus seems to have any influence on spasmophilia or rachitis.

Chloral is very useful as a symptomatic means to arrest the convulsions. It has the advantage over chloroform that it can be left in intelligent lay hands. The proper dosage is about .5 gram, best given by enema. Young children will bear this dose without harm. Usually it leads to subsidence of the spasm in a few minutes and sleep for several hours. The same dose can be repeated the same day, or even for several days, until the casual treatment becomes effective. Children with predisposition to spasmophilia should be kept from excitement and from eating copiously; they should be much in the open air, and especially protected against infections, particularly whooping-cough.*

According to Finkelstein and Zybell, phosphorus and cod-liver oil is not a panacea. In 24 out of 32 of Finkelstein's cases the electrical irritability returned to normal, but it took five weeks to do it. Dubois and Stolte call attention to the fact that the excretion as well as the disposition of the slowly soluble calcium takes place only very gradually. For that reason we do not see any effect of calcium when used therapeutically until after weeks of treatment.

From the experiments of Schabad, we know that 20 to 60 per cent. of calcium acetate is retained by the organism. Calcium phosphate and calcium citrate are not retained at all. Calcium acetate also improves the calcium retention of the food. According to Schabad the good effects of phosphorus and cod-liver oil in spasmophilia depends in the first place upon its power of increasing the calcium retention. Rosenstern in his investigations gave to infants 110 grams of a 3 per cent. $CaCl_2$ solution. He usually noticed a quickly appearing and also rapidly disappearing effect upon the cathodal opening contractions. However, he did not succeed in influencing them for any length of time. The infants did not take kindly to the solution and occasionally vomiting occurred. The maximum effect appeared six hours after the administration; twenty-four hours later the reaction had disappeared. Trousseau's sign was absent only occasionally. The severe laryngospasms disappeared occasionally for twelve hours. In 24 cases Risel saw the electrical irritability returning to normal under the effect of the calcium acetate. Bogen and von Pirquet call attention to the fact that the permanent giving of calcium has no effect. According to Grosser, the calcium retention may increase over 60 per cent. after the injection of calcium glycerophosphate. The calcium content of the food is also retained better. Calcium chlorid as well as calcium lactate and calcium acetate used subcutaneously produce infiltration and pain. Berend made this same observation. According to Zybell the favorable effect of calcium was demonstrable in 17 of the 28 cases. The improvement, however, was restricted in most cases to a temporary change in the K.O.C., while the clinical symptoms remained unchanged. In 14 cases the K.O.C. increased after the administration of calcium, so that its irritating effects were thus demonstrated. From Zybell's more recent investigations, it appears that the antispasmodic effects of calcium were seen in 61 per cent. of the cases. In 25 it seemed to have no effect, in 14 it had an irritating effect, while the clinical symptoms were, as a rule, not influenced. From the experience with calcium salts we may conclude that in certain cases we are able to influence the K.O.C.; however, occasionally the opposite effect may be noticed. A marked change in the spasmodic condition occurs only in a few cases.

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* In recent investigations Dr. Berta Erlanger comes to the conclusion that there is no particular relation between spasmophilia and whooping-cough.

The facts ascertained by Loeb induced Aschenheim to pay especial attention in the treatment of spasmophilic children to the numerator and the denominator of the quotient NA/CA, attempting as far as possible to reduce the amount of irritating salts, not only in the food, but also in the body of the child. He gave a whey-free milk ("eine Aufschwemmung des Gerinnsels" which has been washed several times in water, and which results from the treatment of cold milk with Pegnin, in unsalted gruels to which was added a 3 per cent. Liebig-Soxhlet zücker or a 3-5 per cent. sugar of milk). He takes care that sufficient calcium is retained by giving phosphorus and cod-liver oil. This, according to K. Meyer, not only improves the Ca balance, but at the same time also diminishes the balance of K_2O and Na_2. In the combination of phosphorus and cod-liver oil with whey-free milk, Aschenheim thinks that we have a therapy which, from two different points of attack, diminishes the quotient: $\frac{\text{alkalies}}{\text{alkalin earth}}$.

Reasoning from the fact that the magnesium balance was disturbed along with the calcium and phosphorus in spasmophilia and that the magnesium may at times take the place of the calcium, and that it does not possess the irritating effects of calcium, Berend experimented with injections of magnesium sulphate, apparently obtaining very good results. Bethe and A. G. Meyers emphasized the depressing quality of magnesium which shows itself in the diminution of the existing irritating condition. Fienga comes to the same conclusion. Meltzer has proved that magnesium salts have a very depressing effect on both the sensory and the motor spheres. This result can be immediately reversed by means of calcium. On the basis of Meltzer's experiments on animals, Berend injected magnesium sulphate subcutaneously. He began with an initial dose of 20 cg. to the kilogram of body weight. In not a single case did he notice any toxic effects. In the course of his experiments he found that even double the amount is without toxic effects and is borne nicely by infants even if the injection is repeated daily. In all his cases he noticed that the effect of the magnesium showed itself in the disappearance of the restlessness of the child. Occasionally he obtained fever. Usually he gave for injection from 15 to 20 c.c. of an 80 per cent. magnesium sulphate solution. The magnesium sulphate treatment influences most quickly the electrical irritability and the carpopedal spasms; less quickly the eclamptic seizures and Trousseau's sign. The laryngospasm is least affected, but, nevertheless, more quickly than by the usual method of treatment. The course of tetany is always shortened by the magnesium treatment. Berend thinks that in the magnesium sulphate treatment, artificial foods may be continued during the treatment of spasmophilia with much less danger. If a pathologic K.O.C. alone is present without spasms, phosphorus and cod-liver oil is indicated. but not the magnesium. On the basis of his experience he advises the following procedure: Give the child immediately an injection of magnesium sulphate corresponding to his body weight, empty the bowels with castor oil and after a six or twelve hours fast give a salt-free gruel adapted to the patient's age. In case the spasmodic condition does not show any improvement in two hours, it is best to repeat the magnesium injection. The subsequent treatment depends upon whether or not the spasms have disappeared on the following day. In case the K. O. C. is still very pathologic, it is best to give another injection. If the spasm has not disappeared, it is advisable to increase the amount of magnesium by one-fourth. Usually only one injection in twenty-four hours is necessary. Rarely does the treatment take longer than forty-six days. Berend also administers phosphorus and cod-liver oil, beginning with the second day of the magnesium treatment. In case of reappearance of symptoms a new injection is indicated. If the tetanic spasms have entirely disappeared and only the laryngospasms continue, which are not influenced by the magnesium, Berend stops the magnesium treatment and continues with phosphorus and cod-liver oil. In the magnesium treatment there is no danger of inanition, because it is not necessary to withdraw the food for more than half a day. He emphasized particularly the necessity of a salt-poor diet.

The administration of parathyroid extract has given no result so far. The transplantation of parathyroids in animals has also been unsuccessful. This may be due to faulty technique.

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THE PSYCHOPATHIC CHILD.*

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So much has been written and so much is being attempted for the welfare of children at present, that this subject needs no introduction. Gross ignorance with regard to it still exists and it is essential and opportune that the medical profession, nurses and educators in general shall coöperate to improve present conditions.

Many resources have been provided to educate parents in the proper observation and care of the normal child's physical and mental health, but little or no attention has been paid to the development and education of the backward or retarded child.

What is required is a conscientious observation and a careful recognition of the value of the actual facts as presented in each particular case. One must determine the mechanism of the disturbance and decide when the child shall be at home, at play or in the schoolroom. It will then become clear from the facts offered why anti-social tendencies develop and why, almost without exception, they lead to crime, vagrancy, prostitution or insanity.

It must be remembered that a large part of a child's life is during a period of strain and stress, of conflicting and imaginative thoughts and of habits often attended by serious consequences which may have a direct effect upon the child's ability to learn. Until recently the effort of observers has been to trace all difficulties in child growth to physical defects which is to the mental expert highly fallacious. Because of having had its difficulties placed in the physical realm, many children at their critical moments fail to develop to their proper capacity or to respond to life obligations.

Emphasis must always be placed upon the relation between personality and all types of nervous and mental disorders. It is always essential and will offer undoubted assistance in sizing up the case presented.

Parts of many personalities are shyness, sensitiveness, excitability, passion, which appear at a more or less early age.

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* Read before Butler Hospital Nurses' Educational Society, February 23, 1913.

From this it has been argued that these characteristics are innate, or even hereditary. As a matter of fact, these qualities are frequently neither innate nor inherited. Early experiences and improper development due to these experiences produce the results seen. They are not physical, but entirely mental.

Among these mental stigmata the nurse and educator must watch out for traits that, through their very nature, must be classed as psychopathic. Many of these may be cured, or at least checked, if taken in time.

For example a nurse may see a convulsion, later a peculiar dreamy state in the child, and fail to make the necessary emphasis in her report, thereby making possible a foundation for further continued epileptoid states which might have been obviated. Through this neglect, a personality is rendered possible which might otherwise have been quite different. The nurse should be on watch for poor sleep in the child, frightening dreams, nervous restlessness at night, variability in mood, headaches, for these may play a part in forming an abnormal personality and in producing psychopathic conditions which are absolutely preventable. It may be added that a number of so-called "bad habits," such as nail-biting, bed-wetting, facial tics, fits of temper, over-sensitiveness at the sight of suffering and the seeing of evil in the innocent enjoyments of life, may also be the forerunners of more serious trouble.

This condition has been well styled by Professor Ziehen as psychopathic constitution. In his excellent monograph on "Psychopathic Constitution" his major premise is that children with the psychopathic constitution are not feeble-minded and are not insane, but belong to a class by themselves. I will try to show that such is the case and also demonstrate the great difficulty in absolute differentiation between some types of cases.

These children usually present what might be called a fairly normal period of infancy. They begin to evince disturbances such as poor sleep, extreme restlessness in bed, unrefreshed in the morning, troubled and frightening dreams. During the day they are moody, complain of fatigue at play and they evince great difficulty in their ability to work themselves out of a conflict, a tangle or a temptation. The extent to which the individual is capable of readjusting himself and producing a proper and efficient reaction to problems will determine that individual's level.

I have in mind a child of twelve years whose father is alcoholic and whose mother is apparently feeble-minded. She had one brother, an epileptic, who was drowned, having fallen off a wharf while in a fit. I might say that there may be a question of actual suicide. She was born normally. Walked and talked at an early age. She wet the bed and had frequency of urination during the day. At an early age she showed abnormal affection toward her father and was in constant association with the opposite sex. Her mother states that from a small child she had worms, although she had never seen any and that the patient was in the habit of scratching herself in the perineum. Masturbation has been observed, but sexual lapses had not been definitely noted. As she grew up, she became more troublesome. She steals, she lies, and she is disobedient and untrustworthy. She is destructive. She injures children by squeezing and hugging them. She is an incessant kisser, and upon one occasion in the schoolroom squeezed a child so tightly that she broke two ribs. She not only kisses, but bites and has the craving to fondle them. Her intellectual activities are satisfactory. There are no physical signs. She is not feeble-minded, nor is she insane. She is a psychopathic child and requires special care and instruction. Home conditions are very poor. At school, she cannot be handled in the regular class; the backward or ungraded classes are unsuited for her, and as a result she is dismissed from school and given to destruction. Her fate can be foretold, for she will either become mentally deranged, a criminal or a prostitute.

The second case is a girl of fourteen years, whose mother died in childbirth and whose father is alive, but who has always been extremely alcoholic. One sister is decidedly an imbecile. Her birth was normal and infancy reveals no difficulties. She always wet the bed. At the age of seven years incest was committed by her father in a fit of drunkenness. This frightened the child, but left a lasting impression which resulted in almost continuous masturbation. At the age of nine to twelve sexual indiscretions were many. At twelve years she began to drop off in her school work, became excitable, restless and annoying to the rest of the pupils. She became stubborn and disobedient. She was in constant friction with her aunt and sister. She slept poorly, dreamed a great deal and was exceedingly restless in her sleep. She had visions of a religious type and feared her confession at church. She threatened suicide and upon one occasion was found at the age of twelve and one-half with a rope about her neck. The intellectual tests revealed no grave defects. Physically there was no disturbance. This child, again, is not feebleminded and is not insane. She, too, is a psychopathic child, and because she was properly cared for she is now absolutely well. She would otherwise undoubtedly have been insane or a prostitute.

These symptoms occur also, it is true, in defectives and in backward or imbecilic children. The setting is different, and differential diagnosis is very often difficult. The psychologist has and knows his material, but needs the watchful eye and assistance of the nurse and the educator to make the proper diagnosis.

Let us now pass to another type of child equally in danger and possessing quite a different type of personality. In olden times it would have been called a "perfect child," an "innocent" or a "model" child. This type of child usually evinces a so-called "shut-in" personality (Hoch), offering such traits as lack of affection, uninterestedness in work at school, absence of desire to play, inattention, idleness, fearfulness, irritability, "dreamy" and evident difficulty with the sex problem. There is no doubt but it is an internal conflict, longings or desires that influence this type of mental aberration. This is produced without any disturbance of the will and often without the child being conscious of the source of the influence. It is not uncommon in every-day life to forget names, incidents and so forth, also to make mistakes in reading and writing and do thoughtless acts, all of which have a direct connection with our mental trends. These are not accidental, but actual, and can be traced back to an attempt, instinctively, to forget unpleasant experiences or to complete a desire by a more ethical process.

Let me refer to a boy of twelve years, whose father died following a stroke and whose mother is alive and well. One brother committed suicide at the age of sixteen years. He was of normal birth and has never had any serious illnesses. Nothing wrong was noticed until about two years ago, when he became abnormally quiet, was easily irritated, tired out and laughed without apparent cause. At school his teacher noticed a great change: he was "lazy," not attending to his work, and showed complete loss of interest. He had no playmates, avoided both sexes and remained entirely by himself. Occasionally he would attend a lecture at the Park Museum. A few months ago he began making peculiar movements with his hands and face, would talk to himself and pace back and forth in the yard. He told his mother that life was a burden, not worth the while and that he thought he would end it all. His intellectual tests were correct and there were no physical disturbances. This child has apparently been unable to square himself with the difficulties in life. Let me say that a great many children may show the same set of traits as the above and possibly you may know personally children who are seclusive, quiet, non-mixers, and so forth. But it is not that alone that completes the picture, and again I may say that these symptoms given above may offer a warning and suggest timely care, and instruction may prevent its development.

My next case is that of a girl of sixteen years, whose parents are alive and well. One maternal aunt and several cousins were insane. She is the third in a family of five. Nothing abnormal about her birth or early infancy, except that at an early age she was considered "nervous." She began school at the age of six years and progressed fairly well the first three or four years. She then became what the parents called "lazy," cried a great deal and didn't seem to be able to keep her mind on her work. At thirteen she passed through puberty with its wrenching and nerve-wrecking forces. She then became nervous, seclusive, quiet, non-confiding and at the same time somewhat inquisitive and curious. She cried almost constantly and evinced marked vasomotor disturbances, such as coldness of the hands, lividity of the arms and so forth. She had attacks of anger and occasionally the nightmare. At school she lagged behind in her class and appeared to be further handicapped by her comparison with others and her feeling of being at a disadvantage, as indicated by her apparent intellectual weakness. Physically she evidenced entirely vasomotor phenoma. Intellectually she is inferior, but she is not feeble-minded and there is some question as to whether or not she might be insane. At all events, there is a pronounced evidence of pre-dementia precox. The question arises, Why her intellectual slowness? What can be done? Shall we allow her to fail and, as will undoubtedly follow, become insane?

That surely implies immediate care and protection, and the affording of balancing material to replace those faulty mental habits are necessary. Her specific difficulties at school, to my mind, are not due to actual mental deficiencies or defects, but to a certain inhibition with a secondary attention disorder that began in other interests to which she has transferred her affection.

We thus see that there are features in both sets of cases equally virulent and equally grave in results. The disturbances of emotions are prominent. In the psychopathic constitution the emotion bears close relation to external stimuli, whereas in the pre-dementia precox to internal stimuli. Intellectual training has little to do with influencing the emotional life of such children; it is a component of the individual's personality. In the psychopathic constitution it is a breaking-through of affectivity under poor associative control, whereas in the pre-dementia precox there are changes in their affective life due to the breaking down, which causes disintegration of the whole personality.

Another factor referred to is fatigue, so frequently called laziness, distraction or playfulness, what might be called normal reactions, in a normal person, but which in the psychopathic child is an important factor in their disease-process. School work is not the only cause of fatigue. Kahlbauhm once said that intellectual strain was one of the foremost of the contributory causes to this type of break-down. Recent investigators have shown that intellectual over-work, exhaustive exertion are the individual's attempts to meet a primary difficulty and not factors themselves in producing the disease-process. These activities are revealed not only at home and in the schoolroom, but also on the playground and give undoubted expression to the physical as well as the mental capacity of the child.

Archer says: "The student of child study, who is familiar with the material that has been collected in the past two decades on this subject, cannot be impressed with the great difference that exists between the theory of education which the child study investigators suggest on the one hand, and the theory which underlies much of the actual school work on the other. It is quite evident that there are many instincts and interests of the child already revealed by these investigators which are not taken account of and utilized by the school progress of today. It thus becomes the imperative duty of educators to follow this course of development and work with the growth of psychic evolution and not against it, as is so often the case at present. . . . It is becoming more and more clear as the child-study material accumulates, that the child has feelings, motives, instincts and interests that should guide the educator in his work, rather than that the educator should undertake to direct and modify the child's development. The child must be allowed to evolve naturally and in harmony with the inheritance, but in the school work of today the social inheritance of comparatively recent times continues to be imposed on the child and deeper influences of its soul are strongly touched. . . . It is needless to say that there are hundreds of other vague instincts, motives and interests in a child's soul besides those above referred to. The full and complete expression of these would give every child a richness of mind that would characterize it all through life and enlarge the sphere of interest to an extent hardly dreamed of now."

In treating and caring for such children it is not so much the putting of fresh, new and well-groomed educational interests into their minds as it is of diverting fundamental desires and interests into new channels and utilizing that same energy in other ways. Teachers recognize that they should present their subject matter in the way that appeals to the child, but very little effort has been made to seek out the difficulties of children and straighten them out according to the interests which necessarily require being appealed to.

The question now arises, How is this child problem to be met? In an ideal state a hospital school could be established where timely studies may yield the possibility of detecting those reaction types which produce not only our feeble-minded, but also our insane and criminals. There special investigations could be made by physicians, provision offered for making more efficient the public educator and for training the nurse as well as the child. There, levels of capacity, education and readjustment of faulty mental habits could go hand in hand. It must be remembered that these children should be treated not as a class, but as individuals. Special care in the selection of teachers should be shown, a course in life habits should be established and plenty of provision for amusement and diversion, stimulation of interest and creation of new thoughts. Above all, the educator should be warned against instilling into the child unwise solicitude and he should avoid the introduction of hyperconsciousness in the child in matters away above the child's intelligence.

Butler Hospital.

CHRONIC INFECTIVE ENDOCARDITIS.*

BY ELEANOR C. JONES, M.D.,
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AND
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The recent scientific advances that have been made in the study of the etiology of that familiar and related group of diseases—chorea, rheumatism and endocarditis—point very strongly to a common infective origin. But the question is still unsettled whether the infection is due to a specific microörganism, or whether the infection is due to a particular reaction of the body to a variety of organisms.

The experiments of Poynton and Paine† ‡ in 1900 and 1903 are the most important ones yet undertaken in the study of the etiology of rheumatic fever. They isolated a diplococcus (generally known as the micrococcus rheumaticus), from the blood, joints and heart valves, in about 40 cases of rheumatic fever. They also inoculated rabbits intravenously with pure cultures of this organism and produced polyarthritis, endocarditis and pericarditis. One rabbit developed a condition suggesting chorea. In further confirmation of the specific character of the infection, the organism was recovered from the blood, urine and cerebrospinal fluid of the rabbits used in these experiments. The one weak point in the view that the diplococcus of Poynton and Paine is the cause of these infections, is that the organisms cannot be distinguished either morphologically or culturally from other varieties of streptococci. John H. Richards§ studied two cases of chorea and found the streptococcus viridans in the blood of these patients. He remarks "that this differs in no way from the description of the micrococcus rheumaticus of Poynton and Paine; that, on the other hand, it is culturally identical with the description of the green producing streptococcus described by Schottmueller." Other experimenters have found the streptococcus pyogenes. Lewis and Longcope‖ isolated a streptococcus, before death, from a case of combined chorea, endocarditis and rheumatism, and described this organism as resembling the streptococcus pyogenes. Harris* also, in 1905, experimented with strains of streptococci derived from various sources and produced arthritis in rabbits, which was always purulent in character. He concludes that rheumatic fever is a streptococcic manifestation. Osler† points out that against the view that rheumatic fever is only a mild pyogenic infection is the fact that salicylates have no effect on ordinary streptococcic infections, and, moreover, that rheumatic joints never suppurate.

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* Read before the Alumnæ Association of the Woman's Medical College of Pennsylvania, June 4, 5, 1914.

† Poynton and Paine, *Lancet,* September 22 and 29, 1900.

† Poynton and Paine, *British Medical Journal,* 1903, Vol. II.

§ *Journal of the Medical Association,* January 10, 1914.

‖ Lewis and Longcope, *American Journal of Medical Science,* 1904, Vol. CXXVIII.

The case I wish to report does not help to clear up any of these mooted points, but the sequence of chorea, rheumatic fever and endocarditis are those attributed to a common infectious origin; and the evidences of general infection, as shown by the blood cultures, are somewhat confirmatory of the bacteriologic findings of some of the more recently-reported cases of infective endocarditis.

The personal history of S. J., age twenty years, is as follows: She had her first attack of chorea when twelve years of age, and this was followed by a number of subsequent attacks. The last severe attack occurred when she was fifteen years of age, although she later had occasional choreic movements of the right arm. Owing to these attacks of chorea and general ill health she did not attend school from the age of twelve years to the age of fifteen years. When fourteen years of age she had a severe attack of rheumatic fever with polyarthritis, and was in bed four or five weeks. Since childhood she has also been subject to attacks of tonsillitis. Following the attack of rheumatic fever she developed an endocarditis, with a mitral regurgitant murmur. She was admitted to the Woman's Hospital of Philadelphia September 12, 1913. Her history was that she had been feeling ill since last June and that she was having chills, fever and sweats which recurred almost daily, and had been treated for malaria, but without improvement of her symptoms. The physical examination made at the time of her admission to the hospital showed that she was pale and that she had the appearance of having recently lost flesh. The examination of the lungs was negative. The cardiac examination showed a diffuse heart beat, but no pulsation in the jugular veins. The area of cardiac dullness was from the upper border of the fourth rib to the sixth interspace, and from the left border of the sternum to one-half inch outside the mid-clavicular line. There was a loud systolic murmur present, which was transmitted to the axilla. There was also an accentuated pulmonary second sound present. The skiagram confirmed the diagnosis of hypertrophy of the left ventricle. Her blood pressure (Tycos) was: systolic, 118; diastolic, 90. The spleen was palpable, extending one inch below the border of the ribs. Her finger-nails were blunt with a tendency to blueness. Her right turbinate was hypertrophied and deviated; her right tonsil was hypertrophied and imbedded; the crypts filled with secretion. It was suggested by the throat and nose specialist who made the examination that the tonsil might be the focus of infection.

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* Transactions of Chicago Pathological Society, June 12, 1905.

† Osler, *Principles and Practice of Medicine*, eighth edition, p. 373.

The temperature had a daily range of several degrees. During the chill, which occurred nearly every day, the temperature fell to about 97°, and then rapidly rose to 103°-104°, and as the fever passed off the sweat developed.

Despite the serums and autogenous vaccines of the hypodermoclysis and enteroclysis, and usual stimulating methods of treatment, she failed steadily. The terminal symptoms were those of cardiac failure—that is, vomiting, nose-bleed, edema and painful dyspnea. She died on October 7, 1913.

Appended is Dr. Meine's laboratory report:—

Throat cultures showed staphylococci and a coarse gram positive streptococcus arranged in pairs. Blood smears were found to be negative for plasmodium malariæ. Blood counts varied little. The hemoglobin was 75 per cent.; erythrocytes, 4,640,000; leukocytes varying between 13,600 and 17,000; polymorphonuclears, 80 per cent. A blood culture was made about a week after admission to the hospital. Blood was taken from the median vein under strict aseptic conditions, and cultured on broth, calcium broth, blood agar, placental agar; both aerobic and anaerobic methods being used. The anaerobic cultures remained sterile after two weeks and were then discarded. After forty-eight hours uniformly distributed colonies appeared on the blood agar plates. There were from six to twelve colonies to a plate. They did not grow larger than about pin-point size. They were greenish-grey in color, the medium surrounding them assuming a dark-green hue. There was no hemolysis. When transferred to blood-free media no color was produced. After seventy-two hours and ninety-six hours the same organism was found in the calcium broth and broth culture. Litmus milk turned acid and coagulated. Acid was produced in lactose, dextrose serum media, but not in mannite and saccharose. The organism was a small Gram-positive coccus, arranging itself in chains from six to eight. Cultures grown in calcium broth often showed longer chains.

Unfortunately the patient's condition was such that it was not deemed advisable to make a confirmatory culture.

Repeated urinalysis showed but a trace of albumin, a few hyalin casts and a few pus cells. We, however, injected a guinea-pig and were able to obtain the streptococci from the spleen and heart's blood. Bacilli belonging to the colon group of organisms were also present, and our streptococcus was lost in our attempts at getting a pure culture before we could thoroughly work out its cultural characteristics.

DISCUSSION BY BERTA M. MEINE, M.D.

This case is merely an example of many similar ones reported in medical literature. To-day we must consider chorea an organic disease. Autopsy findings are convincing on this point. Careful examinations reveal minute hemorrhages in the motor areas of the nervous system.

The correlation of chorea, rheumatism and heart lesions has been for years the subject of much contemplation. In 1895 Heinrich Meyers[1] reported a large series of cases. In 80 per cent. of his cases he was able to establish a relation between the diseases. The chorea was not always of the same degree of severity; sometimes the rheumatic attack was mild and of short duration; sometimes it appeared as an erythema nodosum; again as a typical rheumatic fever with polyarthritis. The heart lesions also varied. There was pericarditis, myocarditis and endocarditis. Some of the cases were reported as cured, some as improved, and some came to autopsy. When postmortem bacteriologic examinations were successful the author always found a pyogenic coccus of slight pathogenicity to the ordinary laboratory animals. Sahli's[2] instructive report on the same subject concludes with the sentence: "Cases of true chorea minor in children are of a rheumatic-infectious origin."

We are not ready to speak of a "specific microörganism." We may be dealing with a group or a class of organisms. Wassermann and Westphal[3] obtained a streptococcus from the heart valves of a woman whose death was due to chorea and endocarditis. They kept the culture for four and a half months, and during that time injected eighty-one rabbits with the culture. Eighty developed acute polyarthritis, one dying of an acute septicemia. Recently Rollenstein isolated a hemolytic streptococcus from the tonsils of a patient suffering from intermittent attacks of chorea for a period of five years. This microörganism is capable of producing chorea in dogs.

The controversy concerning the diversity of findings can, to a great extent, be explained by the ability of the microörganisms to adjust themselves to their respective environment. Rosenow's wonderful work on the mutation and variability of the pneumococcus, streptococcus, etc., need only be mentioned in this connection. All habitats of the microörganism and all methods of investigators are not identical. Is it surprising, then, that the organisms vary somewhat?

The argument that there is no pus formation in rheumatism and that therefore the streptococcus is not the causative organism is not convincing, because it is based on a part of the facts and not upon all the facts recognized to-day.

Granted now that the streptococcus is causative, how does it get into the system? What is the focus? It may be the appendix, the intestines, the mouth, the gall bladder, the nose, etc., but probably more important than all of these are the tonsils. The streptococcus viridans has been obtained from the tonsils at the height of a rheumatic attack. A child with chronically-inflamed tonsils may develop endocarditis, even that dreaded type caused by the streptococcus viridans. The chronically-inflamed tonsil need not always be swollen, enlarged and red; even small, deeply-embedded tonsils may harbor pockets of pus in their depths.

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THE CALORIC VALUE OF THE DIETS OF SICK INFANTS.*

BY J. C. GITTINGS, M.D.,
Philadelphia, Pa.

The problem of the artificial feeding of normal infants, reduced to its simplest terms, is to furnish sufficient nourishment, in digestible form, to supply adequately the infant's nutritional needs. That the amount and form of the nourishment vary with the individual always needs emphasis, but it is undoubtedly true that the average needs of the majority will fall within certain general limits which can be used as a basis for general comparison. The problems of feeding are, of course, greatly modified by illness, but the nutritional needs vary within much narrower limits, and the attempt must always be made to approximate normal requirements as closely as possible, since at no time in life can the body so ill afford starvation as in infancy, especially during the first few months of life.

In determining the normal nutritional requirements of breast-fed babies, a careful comparison of the average intake, with the average growth, and a balancing of both with the composition of the milk, in a large series of cases, will give a fair criterion upon which to judge the amount of the various food elements required. The variable factors are the amount of milk consumed and its composition.

Finkelstein estimates that the average normal breast-fed infant consumes about 150 c.c. per kilo of body weight during the first three months of life; slightly less than this during the second three months, and from 120 to 130 c.c. during the third three months.

Assuming that the percentage of solids (disregarding the salts and ash) in human milk equals approximately 3.5 fat, 6.5 sugar and 1.5 protein, this would give a nutritional requirement of fat, 5.25 grams; sugar, 9.75 grams; protein, 2.25 grams per kilo of body weight during the first six months and fat, 4.38 grams; sugar, 8.13 grams, and protein, 1.87 grams per kilo during the next three months.

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* Read before the Annual Meeting of the American Pediatric Society, Stockbridge, Mass., May 27, 28, 1914.

Marfan, on the basis of the researches of Camerer, Forster, Uffelman, Veit and Riedel, has calculated the nutritional needs of infants at different ages as follows:—

		PER KILO.		
Age,	Weight—Kilos.	Fat.	Sugar.	Albumin.
3 days	3.	2.8	2.9	2.4
3 weeks	3.5	5.6	5.7	4.8
7 to 10 "	4.	5.2	5.4	4.5
4 months	6.	4.5	4.6	3.8
18 "	9.	4.0	8.9	4.4
28 "	10.	2.7	15.	3.6

to which may be added by computation—

8 months	6.85	4.36	5.83	3.97
12 "	7.70	4.21	7.06	4.14

The difference between the two series is found chiefly in the relative amounts of sugar and protein, their sum total being about equal.

In determining the nutritional requirements of bottle-fed babies, three methods have been employed, viz: (1) Metabolism experiments, (2) determination of the energy exchange with the calorimeter, (3) "statistical method," in which the intake is balanced over long periods of time with the output, calculated from occasional estimations of the excreta.

The difficulties inherent to metabolic investigations upon infants, and the great variation in the energy output, depending upon the activity or non-activity of various bodily functions and exercise, limit the value of both of these methods, at least so far as the present-day technique has been developed. Howland believes that by clinical observation and not by physiological or chemical determinations will the superiority or inferiority of a diet or method of feeding eventually be established, with the necessary proviso that the clinical observation must be prolonged, thorough and judicious. He also points out that the statistical method can be applied much more accurately to bottle-feeding than to breast-feeding, although the opportunity seems to have been largely neglected.

Until a more certain basis is established we may accept the figures given for the food requirements of breast-fed infants as a fair minimum for the artificially-fed child, with certain modifications to suit individual needs.

Disregarding the salts, about which discussion is rife, the protein undoubtedly is the most important food constituent during infancy. Its three chief functions are: (1) To furnish building material for the tissues of the body, (2) to repair daily waste of tissue, and (3) to furnish heat by combustion.

The first function is of prime importance, especially during the first few months of life. Even if insufficient amounts of protein are fed, and weight remain stationary, or actually diminish, growth in length will take place, although retarded. The repair of daily waste increases with age and activity, at the same time that storage, for purposes of growth, is diminishing. Meara estimates that in the first two weeks of life 75 per cent. of the protein is stored; at two months, 40 per cent., and at five months, 23 per cent.

The third function, heat production, is incidental, since protein is a wasteful source of supply for heat; approximately 30 per cent. of its caloric value is wasted in the physiological processes involved in the digestion and assimilation of protein (Meara).

Of the metabolic changes which fats and sugars undergo in the economy, less is known than in the case of protein, but their two important functions are the production of energy and protection of the body protein. No diet poor in both fat and carbohydrates will produce satisfactory gain in weight, while too great deprivation results in emaciation from the consumption of the body tissue, since protein alone, even in large amounts, is insufficient to supply both energy and food for tissue.

The carbohydrates are more important than the fats as protein savers, and assume increased value in the case of bottle-fed infants, in whom the digestion of fat frequently offers such difficulties.

On the other hand, judging from clinical observation, it is undoubtedly true that fat plays an important rôle in increasing weight, since those babies gain best who can successfully digest liberal amounts of fat. Contrary to the old teaching, there is increasing evidence that infants can digest cow's milk protein as well as that of human milk, while nitrogen retention on a cow's milk diet is equally good, or even better, than in human milk.

While an excess of protein probably entails some dangers, as seen in the interesting experiments of Holt, Lavene and their assistants, where high temperature was regularly produced by feeding a high "synthetic" protein mixture, the danger is less than with an excess of fat or sugar.

Accepting the figures given for the nutritional requirements based on Finkelstein's estimated intake, the caloric equivalent of a breast-milk diet may be worked out as follows, using Rubner's factors of 9.3 calories per gram of fat and 4.1 calories per gram, each, for sugar and protein:—

First three months—

Fat	5.25 grams × 9.3 = 48.83
Sugar Protein	12 grams × 4.1 = 49.20
	98.03 calories per kilo.

From the third to sixth month the proportion is slightly less.

Sixth to ninth month—

Fat	4.38 grams × 9.3 = 40.73
Sugar Protein	10 grams × 4.1 = 41.
	81.73 calories per kilo.

In other words, the caloric requirements of breast-fed babies vary from 100 calories per kilo, during the first month, to 80 calories per kilo at the end of lactation (nine to twelve months). Upon these figures most authorities approximately agree. On the ground that the assimilation of cow's milk requires more work by the infant's organism than is the case when breast-milk is fed, Rubner places the energy quotient (calories per kilo) at 120 during the first few months. Unless the fat percentage in a mixture be quite high, it is impossible to even approximate such a figure as 120, and, with a view to the risk of inducing fat indigestion during the first months of artificial feeding, many authorities accept a lower energy quotient, from 100 to 110 calories per kilo, during the first three months of life.

For practical purposes the factor of body weight is used in determining caloric requirements. A better index, however, is body surface, since loss of heat is proportionate to surface area, while the relation of area to weight is proportionately greater in small than in large bodies. In infants of equal surface area, but different weights, heat radiation is greater in the one weighing least.

In comparing infants' and adults' diets, it is found that infants require a much more liberal supply of all the food constituents in proportion to their weight and a much more liberal supply of fat and water compared to their need for protein.

For example,

	Fat.	Sugar.	Protein.	
Infant, 3 months, 5 kilos ...	5.25	9.75	2.25	per kilo body weight
Adult, 150 kilos .... (Meara)	.71	5.7 to 7.1	1.43	

As Waller points out, the infant requires a greater amount of protein than the adult, in proportion to body weight, but in proportion to body surface the amount is approximately the same.

In stating caloric requirements, allowance must be made for the error due to great deficiency in weight, and the figures for atrophic infants must be increased above the average. Tabulating these requirements, we have,

		Per Kilo.
First 3 mos.,	45 to 50 calories per pound body weight	(100 to 110)
3 to 6 "	40 " 45 " " " " "	(85 " 100)
6 " 12 "	35 " 42 " " " " "	(75 " 90)
12 " 24 "	30 " 40 " " " " "	(65 " 85)

The value of estimating the caloric values lies in the fact that in no other way do we receive such striking proof of deficiencies or excesses in the dietaries. While a fairly wide latitude may be allowed in applying general values in any particular case, and while we should never allow theoretical considerations to completely offset careful clinical deductions, the fact remains that, in the majority of cases, a marked caloric deficiency or excess continued over a length of time is reasonably sure to be followed by nutritional or digestive disturbances. Finkelstein finds that an energy quotient of 70 calories during the first half year results in stationary weight.

The maximum figures of safety are more difficult to determine, as infants show a great variation in their ability to handle excessive amounts of food. Since fat furnishes the highest caloric values, and a normal caloric average is difficult to maintain without a fair percentage of fat in the mixtures, it is reasonable to assume that the maximum figures given in the last table cannot be safely exceeded for any length of time without danger of causing fat indigestion. On the other hand, too close adherence to the principles of caloric feeding entails certain risks, especially in feeding sick infants. The primary object of dietetics in digestive disturbances must be to fit the food to the digestive functions and caloric values must be used merely as a guide to nutritive requirements, not as compulsory dietetic indications. Again, in the attempt to substitute one food constituent for another, which is disagreeing, in order to build up caloric values, due regard must be held for the safe limits of such increase. Probably protein can be increased far beyond the usual average with greater safety than either fat or sugar, but every case must be decided upon its merits and general rules are hard to formulate.

Again, the tendency at times may be to lay too much stress upon clinical data. For example, in the attempt to adjust the diet to the point at which the stools present a normal appearance, the diet may be kept far below the limits of safety. The caloric value of the diet furnishes at once the measure by which we can estimate the risk of starvation and weigh it in the balance against the risk of still further increasing indigestion.

The following statistical investigation of the dietaries of sick infants was made with a view to obtaining a general impression of my own methods, judged by the energy quotient. No deductions can be drawn from it as to the needs of well infants. Certain well-known clinical facts were corroborated and, in the main, the truth of the danger to the infant's organism of under-feeding was clearly substantiated. The length of stay in the hospital was too short to prove any of the dangers of over-feeding, judged on a caloric basis. The study certainly offers a stimulus to greater care in the selection of dietaries, since the percentage of deficiency in some instances was startlingly large and suggests the possibility that a more judicious substitution of food ingredients might have prevented some of the loss. The cases were those seen in my service for the last three years at the Children's Hospital. None was included which was not under treatment for at least one week, the average being three weeks. This eliminated many fatal cases, dying within one week. The majority of patients were suffering from gastrointestinal or nutritional disorders. A small group of miscellaneous diseases was included for comparison. The caloric value of the diets was calculated on the basis of food consumed, careful record of which is routinely noted, and on the caloric value of foods as determined by Atwater and Bryant's tables. No attempt was made to select cases, and only those were excluded which did not answer to specifications of age, diagnosis or length of stay. A few cases were not included because of very frequent changes in diet which necessitated an expenditure of time in calculation that the value of the work did not warrant.

In each case the total caloric value of the food consumed was calculated and the average per day used as a factor in determining the percentage of deficiency (or excess) of that diet. Two standards were used for comparison. First, the caloric requirements of each child, calculated on the basis of his weight on admission; Second, the caloric requirements for an infant of average size and of the same age. The former did not furnish a true index of the caloric needs of each case, as the initial weight often rapidly increased, which entails a corresponding increase in the daily caloric allowance. This initial weight standard furnished an absolute minimum for each child, however, while the normal weight standard furnished a caloric optimum. In determining this normal weight standard, the following weight chart was used. While the figures are somewhat arbitrary, they cannot be considered excessive and comprise the results of a former careful compilation by Dr. Judson and the author. In computing the caloric requirements for the various weights in the table, the factors used were the highest figures in the table, viz: First three months, 50 calories; three to six months, 45 calories; six to twelve months, 40 calories; twelve to twenty-four months, 40 calories, as each child was below the normal weight for its age.

In computing the first standard, namely, the caloric requirements based on the weight on admission, the same values were used.

Weight of Average Bottle-fed Infant.			Total Calories Required,
At end of	1 month	8 pounds	400
" " "	2 months	9½ "	475
" " "	3 "	11 "	550
" " "	4 "	12½ "	575
" " "	5 "	13½ "	600
" " "	6 "	14½ "	615
" " "	7 "	15½ "	630
" " "	8 "	16 "	645
" " "	9 "	16½ "	660
" " "	10 "	17 "	680
" " "	11 "	18 "	720
" " "	12 "	19 "	760
" " "	18 "	21 "	840
" " "	24 "	24 "	960

The total number of cases tabulated was 125. Of these there were 35 cases of infantile atrophy, 72 cases of acute or chronic gastrointestinal disease and 18 of miscellaneous diseases, including pneumonia (8), bronchitis (1), ulcerative stomatitis (2), typhoid fever (1), scurvy (1), syphilis (2), tuberculous meningitis (2), and pylorospasm (1).

In explanation of the nomenclature, the cases of "atrophy" gave a history of prolonged nutritional disturbance, with an average weight of 7 pounds, 14 ounces for an average age of 4.6 months on admission. Cases included under the head of gastrointestinal disease gave evidence of more or less severe involvement of the gastrointestinal mucosa, or had been sick only a short time.

Of the 125 cases, the average weight on admission was 10 pounds, 11 ounces for an average age of 7.3 months. The average nutritional deficiency, therefore, was high.

The noteworthy features of the tabulated results are as follows:—

The percentage of deficiency in caloric requirements based on weight on admission (minimum value) was reasonably small, but the small gain (⅙ of an ounce a day for "all cases," ⅖ of an ounce a day for "recoveries") suggests that it might have been possible to exceed the caloric minimum with benefit.

TABULATED CASES

CLASSIFICATION	Number of Cases	Average age in months	Average days in hospital	Average weight on admission	Normal weight for same age	Average loss or gain in ounces	Mortality	Percentage of deficiency in caloric value of diet taken	
								Compared with that indicated by weight on admission	Compared with that for normal child of same age
				Lbs. Oz.	Lbs. Oz.	Ounces		Per Cent.	Per Cent.
All Cases	125	7.3	26	10—11	15—11	+ 5.4	20%	10.9	36.4
Deaths	26	5.	20	8—11	13— 8	— 14	——	31.2	57.4
Recoveries	99	8.	27-½	11— 6	16 - .	+ 10-½	——	7.2	30.9
Atrophy Cases x—Uncomplicated.	10	4.5	33	8— 2	13 – .	+ 18-½	10%	17.4 excess	28.6
Atrophy Cases xx—Complicated.	25	4.6	28	7—12	13— 2	— 2-⅓	52%	6.4	45.1
Gastro-intestinal x—Disease uncomplicated.	32	7.5	25	11— 4	15—12	+ 13	0	11.9	34.2
Gastro-intestinal xx—Disease, complicated.	40	7.8	25-½	11— 1	15—14	— ½	15%	23.7	44.3
Miscellaneous	6	9.8	21-⅓	12	16—14	+ 13-⅓	16.7%	14. excess	3.0
Tubercular Meningitis	2	11.5	22-½	13—14	18— 7	+ 6-½	100.%	10.8	33.3
Pneumonia	8	12.8	22	15—12	19— 6	+ 2-⅕	25%	15.1	30.7
Typhoid Fever	1	16.	45	16— 8	21-- .	+ 52	0	78.2 excess	45.2 excess
Pylorospasm	1	1.	21	6— 6	8— .	— 1	0	10.6	28.5

x—No fever, diarrhea or vomiting. xx—Fever, diarrhea or vomiting, one or more.

Occasional rectal temperature to 100 F. was disregarded.

Continuous rectal temperature to 100 F. or over 100 for more than 10% of the days was accounted "fever."

Stools numbering under four per day were disregarded. Over 4, were accounted diarrhea.

Regurgitation or vomiting totalling less than 33% of the number of days in the hospital was disregarded; their occurrence on over 33% of the days was accounted vomiting.

The complicated atrophy cases showed about the same deficiency as the "recoveries," but in the uncomplicated atrophies and in the miscellaneous group, where, as a rule, no contraindications to full feeding existed, the diet exceeded the minimum requirements and the gain was proportionately large.

In the gastrointestinal group a similar difference was noted, but the uncomplicated cases showed an actual deficiency instead of excess and received less food than careful attention to caloric requirements would have indicated.

The cases of tuberculous meningitis showed an average *gain* in weight because of forced feeding by gavage in one of the cases, which had received practically no nourishment for three weeks prior to admission. Forced feeding also reduced the percentage of caloric deficiency.

The figures for the cases of pneumonia showed the retarding effect of fever and toxemia *per se* upon the ability to take nourishment, while these effects in the case of typhoid fever were offset by the longer stay in the hospital during convalescence. The tremendous excess of nourishment in the case of typhoid fever also accounts for the excellent gain in weight (½ pound a week) and emphasizes the value of judicious forced feeding in typhoid fever during childhood.

The deficiency in caloric values of all of the diets compared with the requirements for normal children of the same age forms an interesting comparison. It must be judged with a view to the deficiency in weight on admission compared with that of the normal child. For example:—

	Percentage of Admission Weight Deficiency	Percentage of Caloric Deficiency
	Compared with Normal Child, Same Age.	
1. All cases	32 per cent.	36 per cent.
2. Deaths	36 " "	57 " "
3. Recoveries	29 " "	31 " "
4. Atrophy cases (complicated)	41 " "	45 " "
5. Gastrointestinal (uncomplicated)	29 " "	34 " "
6. Gastrointestinal (complicated)	30 " "	44 " "
7. Atrophy cases (uncomplicated)	37 " "	29 " "
8. Miscellaneous	29 " "	3 " "

From 1 to 6, inclusive, show a greater deficiency in calories than in weight, while the uncomplicated atrophies and the miscellaneous group show the reverse. Again the uncomplicated gastrointestinal group shows a caloric deficiency which probably was not justified.

The difficulty in feeding sufficiently high caloric values to very young infants is suggested in the following table:—

			CALORIC DEFICIENCY.	
Age.	Number of Cases.	Average Loss or Gain in Ounces. Ounces.	Based on Weight on Admission. Per cent.	Based on Normal weight for the same age. Per cent.
1 to 3 months	34	0	26	48
3 " 6 "	35	+5½	7	39
6 " 12 "	34	+7	7	30

Finally, the general relationship of caloric requirements to loss or gain in weight may be seen in the following summary:—

			CALORIC DEFICIENCY.	
Age.	Number of Cases.	Average Gain or Loss in Ounces. Ounces.	Based on Weight on Admission. Per cent.	Based on Normal weight for the same age. Per cent.
Cases which lost weight	44	—15⅓	32	52.8
Cases which gained weight ..	78	+17⅓	1.3 excess	27.9
Cases with stationary weight	3	0	28.1	41.6

In closing I wish to express my indebtedness to Dr. Henry S. Kinloch, interne at the hospital, for tabulating the diets, and to Dr. A. Graeme Mitchell for calculating caloric values of diets, etc.

Conclusions.—The value of a conclusion based upon general averages cannot always be applied to the individual case, but if the caloric value of the individual diet persistently falls much above or below the average harm will result in the majority of cases.

Caloric estimations, therefore, should be used merely as danger signals, but not necessarily as sign-posts. Due regard must be paid to the component parts of the diet which go to make up caloric values, and especially to the clinical effects of diet upon digestion and health.

Theory should never outweigh practice, in the best interest of the child, but in the long run sound theory usually will be found to agree with practice.

3942 Chestnut Street.

CASE REPORT

HEMIMELIA THORACICA.

BY F. L. WACHENHEIM, M.D.
New York City.

Stella H., aged one year, was brought to the Mount Sinai Hospital Dispensary for a trivial ailment. Her curious deformity was detected on stripping her for examination, when her left hand and left lower forearm were seen to be missing. The mother attributed her child's misfortune to an intrauterine impression, having seen a one-armed child when three months pregnant.

Examination of the stump showed the distal end rounded, with five projecting tubercles, each about a millimetre in height, bearing at their apices rudimentary finger-nails. This furnished absolute proof that the case before us was not one of intrauterine amputation, because the skin of the finger tips was intact, though underdeveloped.

A Röntgen picture was taken, of which a print is presented. It will be seen that the upper ends of both radius and ulna are normal, the shafts stunted, the lower ends rudimentary—or possibly absent—and the carpal, metacarpal and phalangeal bone centers entirely missing. This clearly proves that the third segment of the extremity had never been laid down. Since, in the embryo, the extremities are differentiated into their three segments in the middle of the second month of intrauterine life, we may be certain that, in this case, the arrest of development took place before that time, at least one month before the supposed maternal impression.

The case further proves that the development of the skin is chiefly dependent on its being pushed out and stretched by the growth of the tissues beneath. The growth of the epiblast depends entirely on that of the mesoblast, but its secondary developments, as the nails and teeth, are laid down irrespective of its growth.

A similar case is reported by Tonarelli*, but here the terminal segment was represented by some carpal fragments. His case presents a similar "Anlage" of the finger tips, but no evidence of finger-nails is mentioned, so that we cannot tell, from this report, whether they were present or absent. Tonarelli, however, decides against amputation, because of the absence of a terminal cicatrix.

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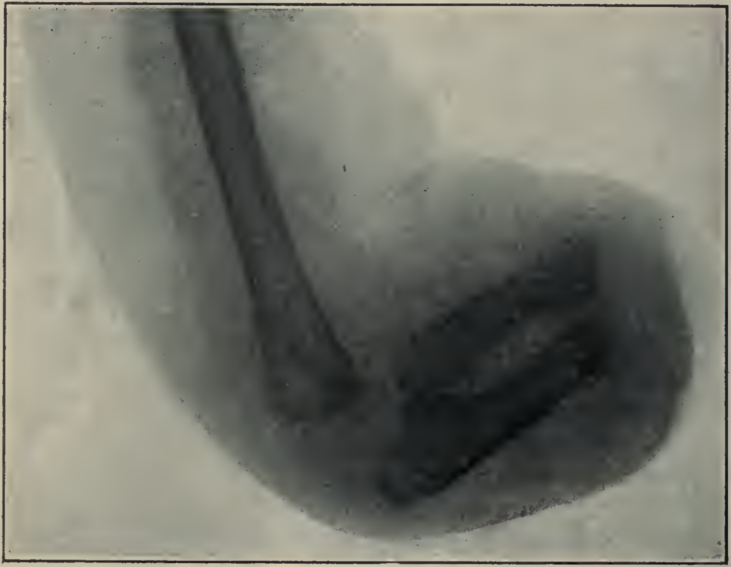
* Monatsschr. f. Kinderh., Vol. II., No. 12, 1903-4.



X-ray of extremity of Dr. Wachenheim's case.

I report my case: first, because of its rarity; secondly, because of its value in confuting the superstition as to maternal impressions; thirdly, because of the light it sheds on certain phases of embryology.

111 West 85th Street.

VACCINE THERAPY FOR PERTUSSIS.—L. Lagane (*Presse Méd.*, July 23, 1913) gives the results obtained by Nicolle and Concor in the treatment of 104 cases of pertussis by vaccine. Of these 37 per cent. were cured, and 36 per cent. improved, after from two to five injections had been given in from three to twelve days. Only those cases were cured that were inoculated within the first two weeks of the disease. These results are not as good as were hoped for, but are still encouraging. It should be noted that the injections have not been tried as a prophylactic measure as yet.—*American Journal of Obstetrics.*

SOCIETY REPORT

THE PHILADELPHIA PEDIATRIC SOCIETY.

May 12, 1914.

WILLIAM N. BRADLEY, M.D., PRESIDENT.

SPINA BIFIDA.

DR. JAMES K. YOUNG presented an eight-months-old child cured by operation. The tumor was large and sessile, complicated by partial paralysis of both lower extremities and bilateral equinovarus. It was a multilocular meningocele, had ruptured at birth and was not infected. At six months it was removed by dissection, the patient was suspended by the feet, 2 ounces of fluid were removed before operation, preserved warm, and reinjected at the close of the operation. The sac was tied off by a through and through suture and purse-string suture, the wound protected by a rubber dam attached by collodion. The patient was kept on the face for two weeks, enemas being given every five hours to secure evacuation of the bowels. Primary union was secured without infection and the baby is well.

DR. L. J. HAMMOND thought that surgeons must be interested in any operation that could cure spina bifida. He had recently observed a boy of ten years, under-weight and under-developed, with talipes equinovarus of the right foot, some muscular weakness of both legs and impaired function of the sphincters of bladder and rectum. This boy was of the type which tends to spontaneous cure, as no other would have survived so long and retained such fair degree of development. The growth had a circumference of eight and one-half inches, the greater part of which was indurated tissue overlying the actual cyst, which was about the size of a black walnut. The cleft involved the fourth and fifth lumbar vertebræ and proved to exist at the expense of the laminæ and spinous processes. Ample bony canal was exposed below the cyst, into which the cauda equina was replaced and retained without harmful pressure. The gap in the spine was closed by transplanting bone and the soft tissues brought together over it. Recovery was without incident, the boy leaving the hospital on the twenty-first day. The X-ray showed the transplanted bone united in perfect position, completely closing the cleft.

Dr. J. P. Crozer Griffith dwelt upon the diagnostic and prognostic indications of the different forms of spina bifida. The spinal meningocele, in which spinal meninges and fluid are contained, but without spinal cord, offered by far the best prognosis, lending itself most readily to operative interference. In the myelocystocele the cord was nearly always present, spread out upon, and forming part of, the wall of the tumor. The prognosis was grave, even after operation; even cases which survived operation were liable to retain evidence of paralysis. If he understood Dr. Young correctly the central spinal canal communicated with the tumor in this case and this would put it in the class of myelocystocele. He thought Dr. Young was to be congratulated on the excellent result.

Dr. Young stated that this child had double equinovarus. It was not a simple cyst, but a large multilocular cyst which had ruptured. He found an opening directly communicating with the spinal cord, which he was able to close. The mortality in these operations is about 87 per cent. in selected cases.

SOME POINTS OF CONTACT BETWEEN TUBERCULOSIS WORK AND PEDIATRICS.

Dr. William Charles White, of Pittsburgh, read this paper by invitation. He first referred to the problem which all branches of the medical profession must face, in the growth of the paternalizing governmental dominance of public health problems and of the necessity for the various departments of the profession doing medical work for the public to correlate their forces and utilize these in the interest of the public welfare, so that when governments come to the point of complete care of the dependent and insured they would find the medical profession far ahead of anything they could hope to attain. In this way the medical profession would retain its proper birthright—the care of the health of the people. Dr. White pointed out the well-known facts of the frequency of tuberculous infection in childhood, taking up the source of infection occurring from midwives during the first days of life, advocating a movement to procure medical examination of midwives, since they come into such intimate contact with the newborn. He spoke of the health of nurses, citing instances where the undoubted source of tuberculous infection in children could be traced to a nurse-girl or servant. Physicians must be sure that those to whom children are intrusted are not suffering from tuberculosis. He spoke of the common ground which pediatrists and tuberculosis workers have in securing a municipally pasteurized milk supply; the relation of various infectious diseases as a groundwork on which the tubercle bacillus builds its most virulent infections; the lowered resistance to other diseases of children coming from tuberculous parents; the relation of tuberculosis to certain skin and eye conditions in childhood; and ended by urging again that pediatrists, tuberculosis workers and others interested in the public health should draw more closely the line of correlation which binds them together.

INFECTION WITH THE TUBERCLE BACILLUS IN EARLY LIFE.

Dr. Paul A. Lewis, by invitation, read this paper.

THE DIAGNOSIS OF CHRONIC TUBERCULOSIS IN EARLY LIFE.

Dr. H. R. M. Landis did not consider acute tuberculosis, tuberculous meningitis, the acute bronchopneumonic form following infectious diseases or surgical tuberculosis. The attitude of the various observers determines whether the recognition of tuberculosis in children is easy or difficult. Children of a tuberculous parent giving a positive tuberculin reaction or showing palpable cervical lymph nodes have all been considered tubercular. Admitting that tuberculosis is commonly acquired in childhood, it by no means follows that this invariably occurs. Heredity, predisposition, race, poor food, bad housing, overwork, worry, illness, dissipation and reinfection later in life—any of these may so lower resistance that tubercle bacilli, already implanted, begin to multiply. Landis studied 362 children, brought to the Phipps Institute three or four years ago, because of tuberculosis in a parent. Within the past few months he has again observed 111 of these children. Over three years ago 25 were considered tubercular; all are now well except 2, 1 of whom died recently of tuberculosis, the other of unknown cause. Slight daily elevation of temperature, to between 99° and 100° F., is not abnormal in children. Physiologically normal physical signs are often exaggerated in children. Thus, 67 of 69 children with physical signs showed impairment and bronchovesicular breathing at the right apex; yet, as Fetterolf has shown in adults, this is probably normal. Of the 111 children recently seen, 17 had had a supposedly diseased right apex, and in 2 others both apices were said to have been affected; yet four years later 17 of these 19 are in good health, 1 still has a cough and only 1 has died of tuberculosis! The expired air may be directed into the pharyngeal vault, or against the roof of the mouth, simulating bronchial breathing all over the chest. Faulty posture also changes the breath sounds. Since it is normal for children to show some enlargement of the lymph nodes, it is not justifiable to consider enlarged cervical lymph nodes an evidence of tuberculous infection. Physical signs supposedly due to enlarged bronchial glands are more fanciful than real, since the X-ray photographs taken of children with these signs have been uniformly negative. Dr. Landis advised against the wholesale massacre of tonsils simply because they were enlarged. The condition of the teeth is of importance in children, since bad teeth contribute to lower vital resistance. A positive tuberculin reaction does not mean clinical tuberculosis, nor does a negative test entirely shut out the possibility of tuberculosis. These tests are of no value except as an evidence of hypersensitiveness. The really important thing is to determine whether these children are physiologically normal, and if below par the sociologic evils are found to be the cause and not tuberculosis. If such a child continue living in unsanitary surroundings, it is sure to become infected in time. These cases are called pretuberculous. When removed from their bad surroundings they again return to normal. The main problem consists in determining whether the child is physiologically normal, and, if it is not, in making every endeavor to provide the means of making it normal.

Dr. W. S. Cornell spoke of the children in our public schools. No examination is possible, as the medical inspectors are not allowed to undress children. An attempt is now being made to group the supposedly tubercular children in open-air classes. There are now one open-air class and seven classes held in rooms with open windows. It is almost impossible to decide whether most of these children have tuberculosis or not.

Dr. S. McC. Hamill said that work undertaken with Drs. Carpenter and Cope to determine the incidence of tuberculosis in children at St. Vincent's Home had emphasized three points: that the conjunctival test was not without danger; that it was much more disturbing in its application and results than the von Pirquet and Mora tests; and that it was not any more or any less sensitive than those. They advised that the eye test should not be used for diagnosis in children. Dr. Hamill believes the routine application of the von Pirquet test advisable, since a positive result probably indicates the existence of a focus of tuberculosis. This should stimulate us to give great attention to the hygiene of such children. Dr. Hamill had found the tuberculin test very confusing when positive in children having pulmonary lesions, indefinite febrile conditions or some chronic impairment of health. He referred to a case, a baby of eleven months, brought to the Polyclinic Hospital Dispensary by a mother with advanced tuberculosis. The baby was emaciated, extremely anemic, having bronchopneumonia. It was so nearly moribund that it was placed in isolation with the expectation that it would die within forty-eight hours. The original diagnosis of tuberculosis was confirmed by a positive von Pirquet test. The infant did not die, but was sent out at the end of six weeks with lungs normal and nutrition good. Either the entire process was tuberculous and the child recovered, or the positive tuberculin tests indicated a limited focus of tuberculosis and the child's serious illness was due to non-tuberculous bronchopneumonia. The first interpretation would seem untenable. Dr. Hamill expressed his appreciation of Dr. White's having urged upon the members of the Pediatric Society the importance of interesting themselves in the social side of the tuberculosis problem, an important division of preventive medicine in whch not only the pediatrist, but the medical profession in general, has taken far too little interest. He was willing to corroborate every statement of Dr. Landis. Like him, he had for years been in the habit of demonstrating to students conditions in the chest of the normal child, which so closely simulated the abnormal as to be frequently mistaken for the abnormal. He laid emphasis upon the danger of hasty physical examinations of the chest. When abnormal physical signs are discovered the chest should be carefully re-examined through a period of time, in order to make it clear that the abnormal signs were not dependent upon the child's position, peculiar method of breathing or other factor influencing the elasticity of the chest wall or the method of entrance of air into the chest.

Dr. J. Claxton Gittings was glad to note that even Dr. Landis had difficulty in diagnosing chronic tuberculosis of the lungs in childhood on the basis of physical signs alone. When we consider that the three chief diagnostic signs of early lesions in adults, physical signs, slight rise of temperature and result of sputum examination, are of little avail in childhood, the concomitant symptoms of poor nutrition, anemia, indigestion, etc., assume increased importance. It was very unfortunate that a definite statement should have gained general circulation, that tuberculosis is contracted only during childhood, when we have barely succeeded in teaching the lesson of the danger of contagion. The definite solution of the question must be left to careful scientific research. Until this has been done it were safer to continue in our present belief. We owe a debt of gratitude to Dr. White for the very kindly way in which he has pointed out our duties in the sociologic care of the pretuberculous or potentially tuberculous child. Assuredly this concerns us as much, or even more, than it concerns specialists on tuberculosis, and it is to be hoped that the lesson, so courteously given, will not be lost.

Dr. J. P. Crozer Griffith said that numbers of autopsy statistics showed tuberculosis to be a very common affection of early life. But it was certainly often very difficult to make the clinical diagnosis. This is true also in the acute cases. In infancy the diagnosis between a marantic state due to other causes and that dependent upon general tuberculosis could often not be made until autopsy; and there was yet no method known to distinguish surely between simple and tuberculous bronchopneumonia except upon discovery of tubercle bacilli in the secretion, which was by no means always easy. In older children acute miliary tuberculosis simulates typhoid fever until, perhaps, tuberculous meningitis appears. Outside of the joints, meninges and peritoneum, tuberculosis is not frequent in children, at least clinically. Small scattered lung foci cannot be discovered by clinical examination and pass into tuberculous bronchopneumonia; and chronic phthisis is very rare. This is not against the well-known frequency of tuberculosis in early life, but against the power to recognize it. He was very skeptical regarding the many published lists of cases attempting to show by clinical examination the frequency of tuberculosis at school age.

Dr. E. E. Graham said that he had always placed some reliance upon a positive tuberculin test. In the study of the many varied conditions in which it may be a question of tuberculosis, he feels gratified when he is able to secure a negative tuberculin reaction. The proper significance to apply to a positive tuberculin test, however, may be very difficult.

Dr. W. N. Bradley emphasized the point that our zeal for breast feeding may sometimes lead us to keep a baby upon the breast of a tuberculous mother. Careful attention should be given to every nursing mother's health and for her sake breast feeding should be stopped the instant tuberculosis is detected.

Dr. White added that the most a positive tuberculin reaction could do would be to suggest that the child might have tuberculosis.

A New Method of Artificial Separation of the Placenta.—Gabaston (*Münch. Med. Woch.*, March 24, 1914) of Buenos Aires refers to a method devised in the University obstetrical clinic, the principle of which he terms the hydraulic. Sterile physiological saline infusion is injected into the divided umbilical vein. This problem was naturally first attacked by experiments conducted on ordinary expelled placentæ. The fluid first distends the large placental vessels; then the organ as a whole becomes much larger, suggesting distended erectile tissue. At last the small vessels in the cotyledons are unable to withstand the pressure and rupture and the fluid escapes at the uterine surface. In the natural condition some differences are necessarily present. Thus the uterus has contracted down upon the placenta, an act often held responsible for the normal separation of the latter by contracting the uterine surface at the placental site. The distention with water aids in detaching the placenta. In certain cases a retroplacental hematoma is the cause of premature detachment and this action of a fluid is of the same mechanism as the preceding artificial procedure. There are several advantages in the new method—among the chief of which is that it does away with the introduction of the possibly nonsterile hand. In many cases of puerperal fever there is a history of manual delivery.—*Medical Record.*

CURRENT LITERATURE

ABSTRACTS IN THIS NUMBER BY

DR. C. D. MARTINETTI. DR. HAROLD R. MIXSELL.

MEDICINE.

CHAPIN, CHARLES V., M.D., SUPERINTENDENT OF HEALTH, PROVIDENCE, R. I.: THE AIR AS A VEHICLE OF INFECTION. (*Journal of American Medical Association,* February 7, 1914.)

Formerly air was thought to be the chief vehicle of infection, now, in most diseases, this theory is untenable. Typhoid fever was formerly thought to be caused by effluvia from decomposing animal matter. There is no doubt that this disease is acquired solely by contact with the B. typhosus.

Cholera, dysentery and diarrhea leave little room for air infection when water, food, contact, flies and carriers are considered. In regard to aseptic surgery, Pasteur and Tyndal proved the ubiquity of putrefactive bacteria in the air, therefore what more natural than to assume that the admission of air to wounds carried with it the germs of putrefaction. However, the fact that these bacteria do not infect a wound is due partly to the fact that their virulence is diminished by drying and exposure to light, and partly to their small numbers.

Malaria and yellow fever have been removed from the list of air-borne diseases and have been placed under the category of mosquito infections. Typhus fever has been proven conclusively to be transmitted by the body-louse. In small-pox the theory of air infection has been exploded. Personal contact is essential and aerial transmission occurs only with the greatest rarity. Plague is primarily a disease of rodents, transmitted by fleas. Pulmonic plague, however, is now placed under air-borne diseases and is transmitted by droplets of coughed-up pulmonary secretion crowded with bacilli. Mediterranean fever is due to the micrococcus melitensis with the goat as the common carrier. It is highly probable that influenza is transmitted by visible droplets at a distance of a few feet only, from coughing or sneezing patients. That it is transmitted by dust or floating droplets is not likely, as the bacillus has a low resisting power. Epidemic meningitis, treated in open wards, does not spread and therefore is unlikely to be air-borne. Anterior poliomyelitis may possibly be dust-borne or transmitted by flies, as in meningitis. Absence of infections in hospitals indicates that the air is not an important vehicle. There is no definite mode of transmission in pneumonia. Evidence is convincing that diphtheria and scarlet fever infections are not air-borne. Contact has been proven necessary, visible masses of coughed-up droplets and sputum being the main source of infection. Measles infection presents conflicting evidence and no definite conclusion can be arrived at. Pertussis is also in doubt, owing to lack of data. The same state of affairs exists also in chicken-pox and rubella. In regard to anthrax, this is a dust infection, while in tuberculosis the weight of evidence points to the fact that it is air-borne.

In conclusion there is little evidence that among the more common diseases aerial infection is a factor of importance. In tuberculosis alone is it a factor. The sewer-gas bogey is laid, the dust theory is unsupported. and mouth spray is effective only at a trivial distance. HAROLD R. MIXSELL, M.D.

DUFOUR, H., AND THIERS, T.: TRANSMISSION OF TUBERCULOSIS FROM MOTHER TO FETUS. (*Ann. de Méd. Inf.*, July 1, 1913.)

The existence of tuberculous lesions in the placenta has been repeatedly proved, as also the presence of tuberculous granulations in the fetus itself. But authentic cases of actual transmission of the disease to the fetus are scarce. The authors refer the case of a young woman who died of acute tuberculous meningitis during pregnancy. At the autopsy a fetus was found with abdomen dilated by ascitic fluid. The placenta, macroscopically, was healthy. The ascitic fluid injected in the peritoneal cavity of guinea-pigs showed in one case a tubercular infection with granules and Koch bacilli. The placenta did not reveal lesions even under the microscope. C. D. MARTINETTI.

McCORD, CAREY PRATT, M.D.: THE PINEAL GLAND IN RELATION TO SOMATIC SEXUAL AND MENTAL DEVELOPMENT. (*Journal of American Medical Association*, July 18, 1914.)

From tumors involving the pineal gland two distinct systems of symptoms and signs ensue—the neurologic and the metabolic. The first set of symptoms are directly due to neoplasm encroachment upon the surrounding intracranial contents. These may appear at any age. The second group appear before puberty.

are metabolic in character and are referable to disturbance in the gland's secretory function. These changes consist of (1) early sexual development evidenced in the enlarged sex organs, pubic hair, general body hair, early changes in voice; (2) precocious mental development, evidenced by maturity of thought and speech, and (3) general body overgrowth to the extent that a child of five or six years may have the appearance of a child of eleven or twelve. The experimental work of the author consisted in feeding to very young animals minute quantities of pineal tissue and to record all weight changes, sexual differences, and, in the case of dogs, increased mentality, over control animals maintained under otherwise identical conditions. In these experiments it was found that some of the changes generally attributed to deficiency of pineal secretion may be produced by supplying an added amount of pineal substance. To reconcile these findings to the actual replacement of pineal tissue by neoplasms with the subsequent hypopinealism, the author advances the theory that these neoplasm cells (adenomata cells and others) may retain the functional characteristics of the pineal cells which they replace and secrete as such.

HAROLD R. MIXSELL.

GRULEE, CLIFFORD S., M.D.: THE CLASSIFICATION AND TREATMENT OF CONVULSIONS IN INFANCY. (*Interstate Medical Journal,* July, 1914.)

Convulsions in infancy are classified by the authors as follows: (1) Terminal convulsions. (2) Symptomatic convulsions. (3) Uremic convulsions. (4) Convulsions due to intracranial pathology. (5) Epileptic convulsions. (6) Spasmophilic convulsions.

The treatment of terminal convulsions offers little. Symptomatic convulsions occur usually in the acute stage of onset of some acute febrile condition, such as the acute exanthemata, or in pneumonia. These convulsions generally go through to their termination, no matter what is done. To prevent their recurrence the use of sedatives is advisable. For this purpose chloral hydrate given well diluted, a grain to the ounce, rectally, is of much value. To prevent recurrence at a short interval the use of anesthetics, either chloroform or a sedative as powerful as morphin, may be given.

Uremic convulsions are very unusual in young infants and are treated along the lines laid down for treatment in adult life. Every effort should be made to control the convulsion in a short time, and if possible not to put any extra work on the kidneys. Free catharsis is of use in these cases.

The treatment of convulsions from an intracranial standpoint is of course the treatment of the underlying condition.

The treatment of epileptic convulsions is ignored by the author, although he regards it as a distinct clinical entity.

Spasmophilic convulsions represent the majority of all convulsions in infancy and much space is devoted to their treatment. As a prophylactic measure nourishment with breast milk should be mentioned. Hygiene is important. Fresh air and cleanliness are advisable and undue handling should be avoided. A barley-water diet during the acute stage will be absorbed better than milk, as starchy foods do not seem to increase the electrical irritability. Active catharsis will oftentimes remove the underlying cause. For the convulsive seizure, chloral, morphin and chloroform are used.

HAROLD R. MIXSELL.

RAND, CARL W., M.D.: A CASE OF SUPPOSED PROGERIA (PREMATURE SENILITY) IN A GIRL OF EIGHT YEARS, WITH REMARKS. (*Boston Medical and Surgical Journal,* July 16, 1914.)

The author's case is cited here with 4 other cases, the first being observed by Jonathan Hutchinson in 1886. Gilford reports 2, and Variot and Pironneau in 1910 report the last. These 4 are striking in their similarity. Progeria does not occur in normal children and only affects those who are the subjects of a form of delayed or arrested growth—infantilism. It always occurs in youth and the body arrested in its growth becomes prematurely the subject of senile changes. In other words, the two conditions of infantilism and senility are both present in the same body at the same time. In regard to the pathology little if anything is known. The result of one autopsy reported by Gilbert in his first case shows nothing definite beyond "an extraordinary mixture of youth and seeming old age." The liver was normal, the kidneys and adrenals were slightly degenerated. All of the internal secreting glands appeared normal. There was a persistent thymus, and marked atheromatous changes in the aorta, coronary arteries and valves of the left side of the heart. It is the author's opinion that in progeria we may be dealing with a polyglandular syndrome. However, feedings of anterior lobe pituitary gland extract produced no apparent change in the author's case. HAROLD R. MIXSELL.

THERAPEUTICS.

FORCE, JOHN MIVISON, M.D.: AN INVESTIGATION OF THE FAILURE IN COW-POX VACCINATION. (*The Journal of the American Medical Association*, May 9, 1914.)

The results of these investigations were: (1) Development of a uniform technique. (2) Investigation of virus. (3) Investigation of alleged immunity against cow-pox.

(1) The arm was scrubbed with ether, which evaporated rapidly and eliminated the necessity of drying. Scarification was done by the rotation of a sharp, square-cornered dental scaling-chisel which removed a small circle of epidermis 2 mm. in diameter without bruising the tissue; the virus was then applied with a sterile toothpick to three scarified spots. The above technique has the advantage of: (1) safety, inasmuch as cross scarification favors the growth of anaerobic bacteria under the crust; (2) economy--with 1 c.c. of glycerinated virus 285 vaccinations have been performed; (3) absence of shock due to rapidity of scarification.

(2) To assure the preservation of the virus it was kept well iced. This was found to increase the percentage of "takes."

(3) No natural immunity against vaccine virus was discovered. HAROLD R. MIXSELL.

MARTYN, V. C., M.D., AND JERVIS, J. JOHNSTONE, M.D., ENGLAND: THE TREATMENT OF DIPHTHERIA. (*The Practitioner*, August, 1914.)

Adrenalin chlorid and strychnin are recommended in small and constant doses from the very commencement of the disease as a prophylaxis against myocarditis. Liberal doses of the antitoxin were found to cause no sequelæ. Bicarbonate of soda was given in severe cases, not only to help in cleaning the tongue and throat, but to tend to counteract the appearance of diacetic acid and acetone due to interference with fat metabolism in the liver. HAROLD R. MIXSELL.

ARCHIVES OF PEDIATRICS

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EDITORIAL

THE NEED OF A STATE PEDIATRIC SOCIETY.

The need of some forum in which questions pertaining to the specialty of pediatrics could be presented and discussed has made itself felt at intervals in various parts of the country.

New York City, Philadelphia and Chicago now support active local organizations with monthly meetings. New England and New Jersey have Pediatric Societies which bring together the workers within their borders. The American Pediatric Society, the American Association of Teachers of Diseases of Children, and the Section on Diseases of Children of the American Medical Association offer opportunity annually for the gathering together of writers and investigators.

All of these organizations have become strong and well supported, while under their influence pediatric literature of the greatest value has been produced with incalculable benefit to the general practitioners and to the children for whom they care. Yet there are doubtless earnest workers in the field of pediatrics who, being remote from the local societies already formed, are feeling the perhaps as yet unformulated need of some organization which shall be at the same time more of an outlet and source of stimulation than the general medical meetings to which they have ready access. Reading this they may ask themselves whether there are not other men within reach who feel the same need. If, however, the impulse stops there nothing will be accomplished. Some account, therefore, may be helpful of the steps in the recent formation of the latest accession to the ranks —the Pediatric Section of the Medical Society of the State of New York.

While the extreme easterly end of the State of New York had long been adequately served by the Pediatric Section of the New York Academy of Medecine, the geographical position of the city unfortunately precluded active participation by the growing number of pediatric men resident in the western portion of the State. This problem became acute in 1911. Under the able leadership of Dr. H. L. K. Shaw, of Albany, letters were addressed to men in all parts of the State known to be interested in pediatrics. Their views were asked concerning the establishment of some State-wide organization which should deal exclusively with pediatric questions, and the numerous replies were almost unanimously enthusiastic.

Owing to the recent division of the work at the annual meetings of the State Medical Society into special sections, patterned upon those of the American Medical Association, it was deemed by the majority more loyal and more practical to apply for the authorization of a Pediatric Section than to form an independent society. A pediatric luncheon, announced for the first day of the annual meeting of the State Society in 1912, was well attended, and a petition to the Trustees praying for the establishment of a Pediatric Section received upwards of fifty signatures. This was promptly granted, and a chairman and secretary were named by the Trustees to serve for the ensuing year.

With a view to disseminating knowledge of the Section and increasing the attendance upon its meetings, letters were sent to the secretaries of all the County Medical Societies in the State asking for the names of those in the counties taking especial interest in the diseases of children. From the replies received a considerable mailing list was formed, which was used for distributing advanced information.

As a further step to evoke enthusiasm, arrangements were made for a special clinical day in New York City, at the various children's hospitals. This was most successful, since it gave the visitors the unusual opportunity of attending upon the same day clinics at some of the most important institutions for children.

Two annual meetings have since been held in connection with the State Medical Society, at which the quality of the papers read and the sustained interest in the discussions have served to establish the Pediatric Section as a permanency. At these meetings registration cards were assiduously circulated at all the sessions to secure the names and addresses of those in attendance. These serve as the basis for the active membership list of the Section.

Pediatrics has ceased to be the interest of but a few pioneers. The battle for recognition as an important specialty has been won by them, and every general practitioner whose practice inevitably includes the care of children is forced to keep abreast of the times. In order to do this he must not only be familiar with the latest text-books, but more than that—with the pediatric journals and the discussions of the Pediatric Societies.

Pediatric Societies have a wider function than that of offering facilities for the reading of papers. As is well known to those who avail themselves of the privileges of such meetings, the benefit derived is not solely from the papers read, excellent as they may be, but also from the discussions by which they are followed. Indeed, instances are frequent where the most practical and illuminating suggestions are to be found in the remarks of those who extemporaneously group their individual experiences about the more formal presentation of the subject by the reader of the paper.

Not to be neglected in this appraisal of values is the opportunity afforded to meet congenial workers from more distant fields. Not only is the seriousness and value of a man's work more readily estimated as one listens to his personal presentation of his views, but the opportunities following such meetings for informal discussion of puzzling and mooted questions and for the acquisition of helpful suggestions from workers in cognate lines are not to be despised.

To knit together pediatric workers in the bonds of friendship, to revivify interest which inevitably suffers from isolation, to send men home stimulated and refreshed to continue their chosen lines of investigation—these, after all, are the crowning functions of pediatric gatherings.

ORIGINAL COMMUNICATIONS

SOME MANIFESTATIONS OF INFLUENZA IN YOUNG CHILDREN.*

BY L. EMMETT HOLT, M.D., LL.D.,

Professor of Diseases of Children's College of Physicians and Surgeons (Columbia University), New York.

It is with some hesitation that one ventures to present a paper on so trite a subject as that of influenza, a term so widely used as a cloak for our ignorance of the explanation of obscure symptoms. I believe, however, that we are now in a position to clear up some of the haze which surrounds this subject and to chart some points at least in this indefinite sea of symptoms. That the term is constantly abused does not prove that there is no such thing as influenza. The same could formerly have been said of malaria. By influenza we mean an infection or inflammation due to Pfeiffer's bacillus and only in this sense is the term used in this paper. The organism is one of those associated with inflammations of the respiratory tract and affects chiefly the lower tract—the trachea, bronchi and lungs—less frequently the upper respiratory tract—the nasopharynx and ears. To apply the term influenza to an ordinary severe head cold is a misnomer; in very few such cases is this organism found. As a rule, the *B. influenzæ* has not a high degree of virulence, but in exceptional instances this may be the case. At such times it may cause a general blood infection and not infrequently meningitis, more rarely joint inflammations.

The diagnosis of influenza is established only by finding the organism in the secretions, usually it must be the bronchial secretion. This renders its discovery difficult in young children. The bronchial secretion is not easy to secure. These patients will not cough and expectorate when desired, and sometimes several trials must be made before satisfactory material for cultures is obtained. The best way of accomplishing this in infants is to excite a cough by tickling the pharynx and to catch upon a pharyngeal swab any secretion brought up from the bronchi. A diagnosis by the examination of smears is unreliable. Only cultures can be depended upon. It should be remembered that the *B. influenzæ* grows only upon media containing hemoglobin

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* Read before the New York State Pediatric Society, Section on Pediatrics, April 28, 1914.

(blood agar being that generally employed) so that cultures made upon ordinary diphtheria tubes are of no value. The difficulties of isolating the organism, even in cultures, are considerable, and outside of a good hospital laboratory the work can hardly be done satisfactorily on any extensive scale. Hence it is not surprising that so few observations upon the definite diagnosis of influenza have been made.

At the Babies' Hospital during the past five years we have been greatly interested in the study of the bacteriology of respiratory infections. The accompanying chart gives the results obtained from 1,650 sputum cultures which have been made from 1,053 patients during the winter and spring seasons of this period. It shows the percentage of cases in which the different organisms, the pneumococcus, the streptococcus, the staphylococcus and *B. influenzæ,* have been present in the different seasons.

SPUTUM CULTURES FOR FIVE SEASONS.

	1909-1910	1910-1911	1911-1912	1912-1913	1913-1914
B. Influenzæ	32.5%	32%	33%	28%	42%
Pneumococcus ...	62.5 "	66 "	81 "	80 "	87 "
Streptococcus ...	33.5 "	37 "	46 "	43 "	29 "
Staphylococcus ..	76.2 "	76 "	89 "	90 "	84 "

While there is seen a general correspondence in the different years, it will be noted that there has been an unusual prevalence of influenza during the present season. This has been particularly true during the months of March and April. Our observations for the past five years indicate that influenza begins as the cold weather approaches, usually toward the end of October, but that it is not very frequent until after January. The spring months are usually the time when it is most often seen. Also, that it disappears regularly with the advent of warm weather, about the middle of May. Pneumococcus infections do not follow the same course, but are common throughout the year.

What does the presence of the *B. influenzæ* in the sputum signify? Some have said that it signified nothing; that the organism can hardly be regarded as pathogenic. Although this view was formerly held by many pathologists, there are now few who maintain it. The occurrence of an acute purulent meningitis in which this is the only organism found and the production of a similar inflammation by its injection in animals with recovery of the organism, certainly establishes the fact of pathogenicity.

The *B. influenzæ* is only one of the common organisms associated with respiratory infections. It is seldom seen alone and it is therefore difficult to determine exactly which of the symptoms present may be fairly attributed to it. It is only by the study of a large number of cases in which the organism is found that this point can be settled.

Probably the most significant manifestation of influenza is a peculiar range of temperature. The variations seen are most puzzling and frequently wrongly interpreted. They often give the physician the greatest concern, especially since they occur so frequently in the course of pneumonia or otitis; they may lead to a suspicion that some serious complication, either medical or surgical, is present. The temperature is apt to be high, to fluctuate widely and irregularly without apparent cause. Its rise is sharp but without chills. In its fall, which is quite as rapid, it frequently goes to subnormal. The want of correspondence between the general symptoms and the temperature is quite diagnostic. I know of no disease in which such high temperatures are seen with so few general symptoms as in influenza.

From our experience at the Babies' Hospital several definite clinical types stand out:—

(1) Pneumonias with unusual, often extraordinary, fluctuations of temperature or with a persistence of temperature after physical signs have disappeared.

(2) Pneumonias running a protracted course, with slow resolution. Frequently there are recurring attacks.

(3) Cases of otitis with very mild catarrhal symptoms, often only a moderate cough and a few coarse râles in the chest, but with a temperature quite out of proportion to the general or local symptoms.

(4) Cases with very few or no catarrhal symptoms whatever, but with a very unusual temperature curve.

(5) Unusual temperature curves accompanying tuberculosis and sometimes other diseases.

(6) Cases resembling whooping-cough, seen chiefly in older children, seldom in infants.

Let us consider this last-mentioned group first.

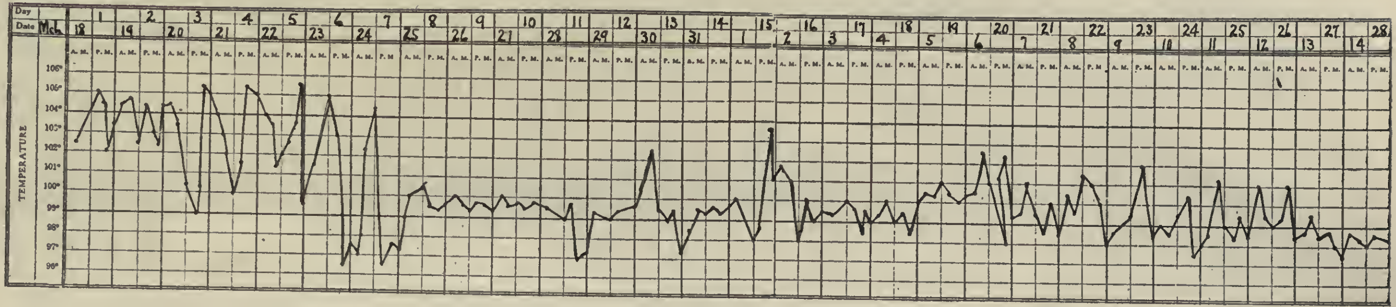
Pfeiffer's bacillus has many points of likeness to Bordet's bacillus. There are also clinical resemblances between whooping-cough and influenza which I think have not been sufficiently appreciated. Influenza often persists for from six to eight weeks; it may be characterized by a paroxysmal cough which is so like the paroxysms of pertussis that at times the two are indistinguishable. It is my own belief that most of the children who are reported to have recurrent attacks of whooping-cough have, in reality, suffered from influenza.

There are some points of differential diagnosis which we may pause here to mention. The blood picture in whooping-cough is quite different from that seen in influenza. Influenza without catarrhal symptoms is seldom seen and then it has a relatively low leukocyte count, but with its usual bronchitis there is a leukocyte count, but with its usual bronchitis there is a leukocytosis of 18,000 to 30,000, the differential count showing 60 to 70 per cent. of polymorphonuclears. In whooping-cough there is a leukocytosis of about the same degree, but a very high lymphocyte percentage is regularly present.

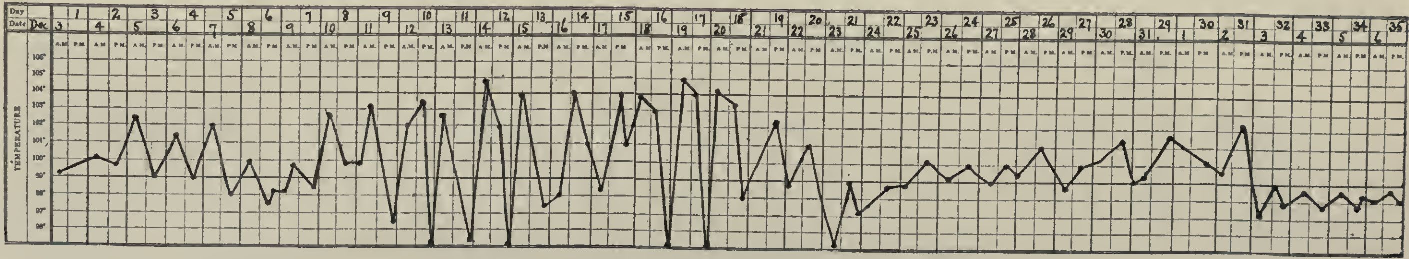
Another point of resemblance is the contagious character of influenza and the fact that there may be in the same family two or three children with identical symptoms. A few years ago three children in a family all had at the same time typical whooping-cough. During the following year all three developed a protracted paroxysmal cough which, except for the previous year's experience, would unquestionably have been regarded as whooping-cough. Sputum cultures from all three during the second season, however, showed the presence of the influenza organism.

During the past few weeks the Resident Physician in a hospital where much influenza was prevalent developed a paroxysmal cough of such severity that vomiting occurred two or three times a day. One physician who saw him made an unqualified diagnosis of whooping-cough. His blood, however, showed 19,000 leukocytes, with 68 per cent. of polymorphonuclears, and his sputum contained great numbers of the influenza organisms, but not Bordet's bacillus, although careful examination for it was made. I think, therefore, that we should be extremely cautious in making the diagnosis of recurring attacks of whooping-cough.

Since January, but especially during the months of March and April of this year, an unusual amount of influenza has been



CASE I. Child with Lobar Pneumonia at Left Base.



CASE II. Child with Bronchitis and Otitis Media.

seen in the Babies' Hospital. In consequence of this, on April 19th and 20th sputum cultures were made from all the hospital inmates—doctors, nurses and patients.

Of 90 persons examined, 31 showed the presence of influenza at this examination and 3 others had shown it previously, making a total of 34 infected persons, or 38 per cent.

The most marked prevalence of influenza was in the wards in which patients with bronchitis and pneumonia were received. In two such wards, containing 21 patients, 10 had influenza. Of 8 nurses in attendance in these wards, 5 showed influenza. Six of the patients were suffering from bronchopneumonia, 3 others previously had slight temperatures not explained by the other symptoms present; a fourth case, one of tuberculous meningitis, showed only a few influenza organisms. Two nurses had no symptoms suggesting influenza infection, but one shortly after the culture was taken developed a severe cold; the other three were suffering from catarrhal symptoms of various degrees of severity.

A nurse in charge of a special ward containing 3 children who were suffering from influenza, showed the organism in her sputum. She had previously suffered from a mild cold.

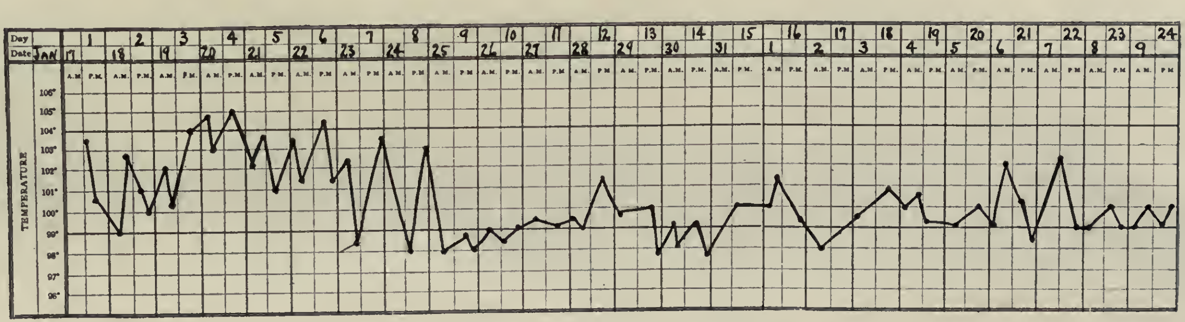
Of the remaining 25 nurses in the hospital only 4 showed the *B. influenzæ,* and 3 of these had suffered from colds or a nasopharyngeal infection.

The Resident Physician, as above stated, had a severe paroxysmal cough and his sputum showed great numbers of influenza bacilli.

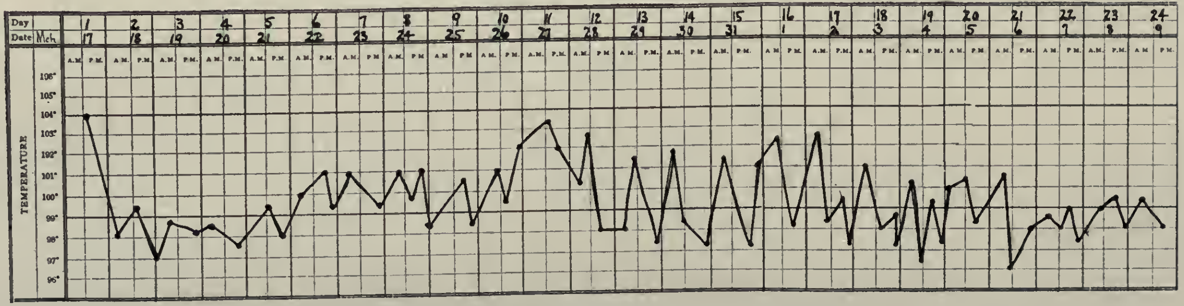
Of 10 cases of pneumonia in the hospital at the time of the routine examination the sputum of 8 showed the B. influenzæ. Of 8 children admitted with pneumonia during the week following, 5 gave positive influenza cultures. Since the number of children admitted with influenza is so large the presumption is that the nurses contracted it from these children and then possibly spread the infection to others.

An unusual prevalence of influenza has been noted in some other institutions in the city where careful sputum cultures have been made. Dr. Swift, of the Rockefeller Institute Hospital, informs me that of 13 pneumonia patients during the first three weeks of April, 8 showed the presence of the B. influenzæ in the sputum cultures.

That the temperature curve and the course of pneumonia is



CASE III. Child with Pneumonia.



CASE IV. Child in Third Week of Pneumonia.

influenced by the influenza complication, no one looking over these charts can for a moment question.

There are still many points to be settled regarding influenza infections. To call every case having an unusual temperature one of influenza is certainly a serious error; but that this infection causes very remarkable fluctuations of temperature in respiratory infections should certainly be recognized. Such temperature curves, I believe, are constantly misinterpreted.

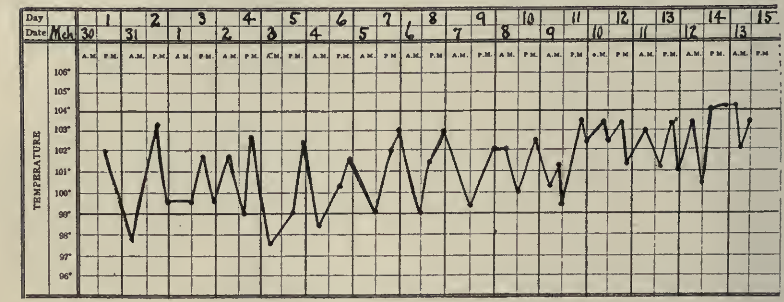
Uncomplicated influenza has a good prognosis; when influenza occurs as a complication of pneumonia it certainly increases the danger of that disease, particularly on account of the tendency to prolong its course and to increase the liability to recurrent attacks. One never can be quite sure when these patients are entirely well. The influenza organism we have found to persist for months in the sputum of children and during this time there was a constant tendency to recurrence of the catarrhal symptoms of greater or less severity.

Of treatment there is little to be said. Thus far it has seemed to me quite unsatisfactory. Its definite contagious character certainly increases the necessity for isolation. This is difficult to maintain both in a hospital and a household where nearly always there are several cases in a family. In hospital practice I am convinced that we have been negligent in not paying much greater attention to the separation of these cases from other inmates; for the added risks following infection in children are certainly considerable, not so much from the disease itself as from the complications with which it may be associated.

Cases of respiratory infections complicated by influenza are, in my experience, seldom benefited by cold air, although fresh air certainly is needed. They invariably improve when the warm days of spring come. If symptoms persist it is desirable to send children south to a warm climate. With others, the plan of "watchful waiting" seems to give the most satisfactory results.

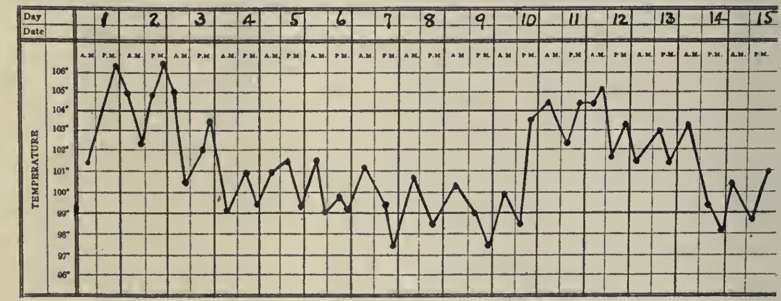
The accompanying charts illustrate the most frequent types of temperature seen in influenza cases. With one exception, all of the patients have been observed during the past few weeks.

In none of these cases were any antipyretics given or any measures employed for artificial reduction of the temperature. In all cases a careful examination was made of the urine, the ears, the digestive tract and the other organs to determine if possible whether there was any other factor present which might explain the temperature. The diagnosis of influenza was not admitted until all these had been excluded. In every case the diagnosis rested upon the finding of the influenza organism in numbers in the sputum cultures, and, in most cases, they were found repeatedly. The evidence seemed conclusive that influenza infection was a factor in the production of the clinical symptoms.



Case V. Child with Tuberculous Peritonitis.

Case I. was a well-nourished child of fourteen months, admitted with a lobar pneumonia at the left base; signs of resolution appeared shortly after the crisis, but the resolution was slow. The temperature continued some time after the lungs were clear.

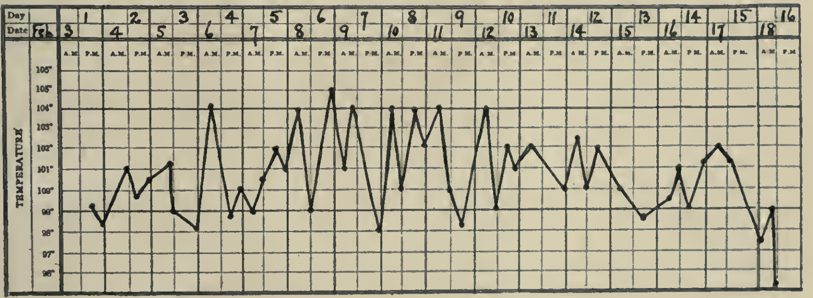


Case VI. Defective Child. No Catarrhal Symptoms.

Influenza organisms were found in the sputum both during the height of the pneumonia and subsequently.

Case II. was that of a delicate infant nine months old, admitted with a second attack of bronchitis, having been ill for a week. Otitis developed and double paracentesis was done on the third day, repeated again on the tenth. The left ear was again opened on the twelfth and the twenty-fourth day. No explanation for the wide fluctuations in temperature could be discovered except the influenza, the sputum cultures showing the presence of the organisms. A small spot of pneumonia developed on the eighteenth day. Death occurred on the forty-fourth day. The autopsy showed no disease of the mastoid or of the sinus, but the cultures from the lungs showed the *B. influenzæ* and the pneumococcus.

CASE III. was a well-nourished child of seven months, admitted on the twelfth day of his illness with a circumscribed consolidation of the right lower lobe. The only unusual feature was the irregular temperature curve. The lungs cleared up rapidly after the crisis. The influenza organisms were found in the sputum early in the disease, but not after the lungs had cleared.



CASE VII. Child with Tuberculous Meningitis.

CASE IV. was a small but fairly-nourished child of nine months, admitted in the third week of a pneumonia of the right apex; physical signs were typical. The temperature fell by crisis the day after admission. The early sputum cultures showed no influenza. The subsequent rise of temperature was accompanied by an increase in the catarrhal symptoms which followed a partial resolution and at this time the sputum cultures showed the influenza organism. In this case the child appeared to have contracted the infection in the hospital, as he occupied a bed next to a child who was found to have an influenza infection.

CASE V. was one of tuberculous peritonitis. The symptoms were typical, but no satisfactory explanation could be found for the unusual temperature curve. Frequent and repeated examination of the lungs and other organs showed no generalized tuberculosis, but, as influenza organisms were present in the sputum in numbers, this disease was suspected. At autopsy there was no sign of a generalized tuberculosis, the lesions being essentially those of a tuberculous peritonitis only.

CASE VI. is that of a child nineteen months old who was admitted to the hospital as a case of mental deficiency. Neither cough nor fever had previously been present nor were they present during the illness. On the day of admission the temperature was found to be 102° and quickly rose to 106½°. There was a leukocytosis of 20,000, with 66 per cent. of polymorphonuclears. The lumbar puncture was negative as well as the examination of the other organs. With this high temperature the child did not appear very ill, and when the temperature fell to, or near, normal the symptoms had quite disappeared. A second rise occurred a few days later with a repetition of the original symptoms and also without any special prostration. At this time also careful examination of lungs, urine, ears were all negative.

CASE VII. was an infant five months old, admitted with the diagnosis of tuberculous meningitis. A clear fluid was drawn by lumbar puncture which contained a large number of cells, chiefly lymphocytes, and tubercle bacilli. On the third day the temperature rose and continued high and fluctuating until death. The clinical symptoms resembled those of a cerebrospinal meningitis. A blood culture and a culture from the sputum both showed the *B. influenzæ;* the spinal fluid remained clear; but a smear contained a few organisms resembling influenza bacilli. The autopsy showed a tuberculous meningitis at the base and a purulent meningitis at the convexity from which the influenza organism was obtained in pure culture. This case has been fully reported elsewhere.

INSURANCE AGAINST SMALLPOX.—An English public vaccinator states that for the past eleven years he has offered, in connection with every vaccination showing four good vesicles, $250 if smallpox is contracted within ten years. At a time when smallpox was prevalent in his community, he gave a written undertaking to pay the sum of $4,000 to any clergyman who submitted to revaccination and who contracted smallpox as a result of a daily visit to the patients in the smallpox hospital.—*Monthly Bulletin, New York State Department of Health.*

THE CAUSES AND TREATMENT OF ECZEMA IN INFANCY AND CHILDHOOD.*

BY ROWLAND G. FREEMAN, M.D.,
New York.

Eczema, being a disease of the skin, might seem to be a disease which, in a city like this, abounding in specialists, should be always treated by a dermatologist. This disease, however, occurring in infancy, needs, I believe, a pediatrician more than a dermatologist, for while the applications to the skin are important, in most cases the regulation of the diet and the daily regime are far more important than the local applications.

It is not my intention in the following paper to attempt to cover the whole subject of eczema in infancy, but to consider certain types which one frequently meets with in practice. We meet with acute eczema and chronic eczema; eczema of internal origin and eczema of external origin, but under good surroundings at least eczema of external origin without internal derangement is rare.

Eczema is one of the common diseases which the pediatrician is called upon to treat and is often considered one of the most resistant to treatment. There is also a popular idea, in which some members of the medical profession sympathize, that the cure of eczema may be followed by sudden death, and this may well be the case if an attempt is made to cure eczema of internal origin by external applications only. In a recent number of the *British Journal of Children's Diseases* a number of cases of eczema, the cure of which was followed by death, have been reported. This report, however, deals only with the local treatment of this condition, no mention being made of internal treatment.

The eczema of infancy follows many types and may be acute or chronic. Acute eczema not infrequently develops during the first weeks of life in children fed at breasts which produce much more milk than is required for the nourishment of the child. It gives often a fairly typical history. These babies may be gaining from 10 ounces to 1 pound a week and are having from five to six movements a day, which, while yellow, contain mucus and curds. Suddenly the skin of the face and body becomes red and soon assumes the typical dry, scaly appearance of eczema. On weighing the baby before and after nursing it is found that the child is getting much more food than it is entitled to, while an examination of the breast milk shows a normal or rich quality. These babies are readily cured by reducing the time of nursing so as to limit the baby to the proper number of ounces for its age.

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* Read before the New York State Medical Society, New York City, April 28, 1914.

Illustrative cases of this condition are as follows:—

A baby four weeks old, weighing 8 pounds at birth and at one week, now weighing 11 pounds, or a gain of 1 pound a week for the three weeks, broke out in a general eczema involving the face, scalp and body. It was having about six movements a day, which were yellow and curdy with mucus, and was getting from 3 to 7 ounces of milk at a nursing. The milk on analysis contained about a normal amount of fat, sugar and proteid. The nursings were cut down to 3 ounces every three hours and Lassar's paste was applied to the skin. In six days the rash was a little better; in eleven days the movements were reduced to two a day and the baby was again practically well. The urine in this case showed no material abnormality.

Another child fed by a wet nurse was two weeks old; it had gained 1 pound during the second week, at the end of which time it was found one morning to have a eczematous rash all over its body. It was having six movements a day, yellow, with curds and mucus, and had gained 9 ounces in two days. The feedings were cut down to 3½ ounces. The wet nurse was dismissed and the mother's breasts used with accessory feedings. Lassar's paste was used on the body and a rapid recovery ensued.

Most cases of eczema in infancy and childhood, if actively treated when they first appear, can be controlled as readily as these two cases.

Many cases of eczema in older children, particularly those of long standing, are more difficult to treat, especially if on inquiry it is found that the child has been on a normal amount of a well-balanced ration. In such cases considerable information may be obtained by a careful analysis of the urine directed particularly to the detection of marked acidity, to the presence of acetone and diacetic acid, or evidence of intestinal intoxication as shown by the presence in the urine of indican and phenol.

If the tongue is coated efforts to improve the digestion so as to give it a normal appearance should be undertaken, while if the movements show irregularities or any elements of food are present in abnormally large amount an excellent clue would be furnished for dietary modification.

Local sources of external irritation must of course be removed, especially pediculi capitis, plugs of wax or inflammation of the ears, adenoid obstruction, or the irritation from an adherent foreskin shutting in decomposing smegma.

While the removal of these external sources of irritation may hasten the cure, the internal derangement, usually of the gastro-intestinal canal, is of far more importance. Evidences of such disorders may be apparent in a heavily-coated tongue, an offensive, putrid, sour, acetone odor of the breath, or in a distended abdomen and a history of hiccough or belching of gas, or in the passing of considerable gas from the intestine. The stools also furnish frequently an important clue, an analysis showing some part of the food undigested, while constipation or diarrhea should be corrected. The putrid stool indicating proteid decomposition, the sour stool indicating carbohydrate disorder or the ammoniacal urine indicating too much fat in the food should be noted and efforts directed to their correction instituted. In addition, the study of the urine, as indicated above, will aid in the determination of the character of the disorder and its correction.

The type of eczema varies. Usually there is a seborrheic eczema of the scalp, often an eczema of the cheeks, or in the fold behind the ears. The neck may be involved or the parts under the diaper irritated by the acidity or alkalinity of the urine or stools. In other cases isolated areas persist for years—patches on the back of the hands or wrist or on the legs or buttocks.

The treatment of these cases must begin with the removal of the external sources of irritation and a complete study of the internal disorder to ascertain in what respect the diet is in error or in what way the overworked digestive organs may be relieved. The urine may furnish information by its concentration that too little water is taken. Its excessive acidity or an acidosis as shown by the presence of acetone or diacetic acid may call for the use of saline laxatives and alkalies, or an intestinal intoxication as shown by the presence of indican and phenol may indicate a putrefactive process in the intestine which may often be relieved by the administration of lacto-bacillary culture. Excess of fat or carbohydrate in the stools should direct attention to the reduction of these elements in the food.

In many cases the trouble is, as in the cases mentioned above, too much food; in others a badly balanced ration; in others some irritating food, such as eggs, oatmeal, stewed fruit, cake, candy, preserved fruit, jam or marmalade. In these cases we have one of the most important uses for caloric feeding. An estimate of the amount of food required to properly support life should be made and this should, if possible, be given in a well-balanced, mixed, digestible diet. There are exceptional cases where a poorer but more easily digested food may be given, the calories being made up largely of sugars as in malt soup. If such foods are resorted to they should be used only temporarily until the condition is under control.

The external treatment we must learn from the dermatologist, and most of my resources for external treatment I have obtained from Dr. George W. Crary. One fact I have learned from experience and that is that in order to get the most prompt result the application must be kept in constant contact with the diseased skin. For facial eczema a mask should be worn, while on the limbs the application should be covered by lint and bound in place. Lassar paste, made from one part zinc oxide, one part starch and two parts vaselin, is altogether the most useful application for the skin, especially of the face. It may be rendered somewhat antiseptic by the addition of 2 per cent. resorcin or eurosal. For the dry, chronic eczematous patches on the body or limbs of babies I find one part tar ointment to seven parts Lassar paste most useful. For the scalp in some cases a diluted sulphur ointment is useful.

I will narrate a few cases in which these methods were used. A child, seven months old, fed on normal milk modifications, at times on mixed milk dilutions, at other times top milk modifications, had suffered from eczema since it was one month old. It weighed fourteen pounds, was well developed and normal. Its face was red and oozing in places; it had thick, dry patches on its knees and shins and involvement of the parts under the diaper. In order to nourish the child, at the same time relieving its digestion, malt soup was ordered, rhubarb and soda given, and Lassar paste applied, the parts being bathed with 2 per cent. resorcin solution night and morning. In eight days the skin was much better and the child had gained a pound.

In twelve days the skin was well, although rough places occasionally appeared; they readily disappeared on treatment and no tendency to such trouble has recently shown itself.

A boy, four years old, had developed eczema during his first year and had been troubled with it ever since. He had a coated tongue, was nervous, constipated and had recently had a cold and bronchitis. For three weeks he had been on the following diet:—

Breakfast—Apple sauce, egg, milk and malt soup.

Dinner—Soup, meat, vegetables, prunes.

Supper—Egg, apple sauce, milk and malt soup and cereal.

He had patches of eczema on the hands and face. His diet was limited in amount, the apples and prunes and malt soup were eliminated as well as the egg at supper. Lassar's paste and resorcin lotion were applied, while rhubarb and soda was administered. In eight days he was much improved and within two months entirely well. There has been no return of the trouble.

Another child, two years and four months old, had had a bad attack of eczema at seven months and since that time had not been free from some patches. She was then nervous, a poor sleeper, had night terrors and was constipated. Her diet was modified by taking away raw peaches, cream and Nabisco biscuit; and local applications were ordered. In one month the eczema was healed and there has been no return of it.

Another child, nineteen months old, had suffered from a severe general eczema, involving the whole body, face, scalp and limbs. She had been treated by specialists in Berlin, Paris and New York and the mother was finally told by a New York dermatologist that she should consult a pediatrician. The child was fed five times between 7 A.M. and 5 P.M., and her diet included milk, stewed prunes, bread, butter and cereal. She took a quart of milk a day beside other carbohydrates and fat. She would not take eggs. The urine was alkaline, specific gravity 1,010, otherwise negative. The feces showed excess of carbohydrates. She weighed 28 pounds and was thirty-five and one-half inches long. Her diet was laid out on a basis of a required 30 calories to a pound. Four meals were given a day, furnishing in all 865 calories.

7:30 A.M.	Milk, 8 ounces	170 calories	
	Water, 2 ounces		
	Cereal, tablespoonful	25 "	
	Rusk, ½ ounce	65 "	250 calories
10:30 A.M.	Milk, 8 ounces	170 "	
	Water, 2 ounces		170 "
2 P.M.	Clear soup, 3 ounces		
	Well baked or boiled potato, tablespoonful	100 "	
	Slice of bread, 4 inches square, ⅜ inch thick ..	75 "	
	Tablespoonful of squash, or puree of lima beans, or boiled rice, or well-cooked macaroni	35 "	210 "
5:30 P.M.	Milk, 8 ounces	170 "	
	Water, 2 ounces		
	Rusk, ½ ounce	65 "	235 "
			865 calories

To this meat was added later. The bowels were kept open and ointment was applied continuously. In two months a marked improvement had taken place. The face was clear and most of the body and arms had healthy skin. Some patches, however, remained, which were all healed in five months and there has been no recurrence.

In conclusion: the eczema of infancy and early childhood, which is occasionally due to external irritation, is usually due to gastroenteric derangement and must be attacked primarily by correcting that derangement. The food should be cut down to caloric requirements, the ration should be balanced and digestion aided. Stewed fruits and cream should be prohibited. The parts affected should be kept well covered with non-irritating applications.

RECURRENT BRONCHITIS IN CHILDREN. *

BY CHARLES GILMORE KERLEY, M.D.,
New York.

By recurrent bronchitis we are to be understood as including those cases of illness in which there are attacks of bronchitis with severe cough, often with bronchial spasm. A small proportion of the cases suffer from true asthma. Fever, while sometimes present, is not necessarily a part of the disorder. The child is brought with the story that there are frequent colds and cough and bronchitis, the bronchitis is usually of an asthmatic type, that one attack is barely recovered from before another supervenes, sufficient in many cases to entail chronic invalidism, preventing or seriously interfering with attendance at school. The repeated illnesses entail a housing and loss of appetite, which, in the process of time, may result in defective growth and development. Usually, but not invariably, the child is free from trouble during the summer, but with the advent of autumn the so-called colds begin. These cases are to be differentiated from the usual infectious colds, bronchitis and influenza that in these disorders there is fever, prostration and loss of appetite. Of course there may be at times an associated infection but in the vast majority of the attacks in a given case such symptoms are not present.

As time passed and a great many cases of this type were encountered, it was impressed upon me that there must be some common ground, some similar constitutional state that rendered these children subject to the attacks, that rendered them unable to stand the usual exposure which failed to affect other children. Through comparison of the cases and investigation of the family histories, it appeared to me that I could set apart these children, that they could be grouped in a class having several features in common. It was found that a considerable proportion of the patients had been difficult feeders, in infancy, that bottle-feeding had been unusually troublesome. It was also found that not a few were subject to, or had had, eczema. It was found that recurrent vomiting and so-called bilious attacks were not uncommon, and that many of the patients were the offspring of those who had suffered from disorders of metabolism

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* Read before the New York State Medical Society, Section on Pediatrics, April 28, 1914.

such as gout, rheumatism, periodic headache, so-called bilious attacks and chronic eczema.

They were very apt to have a habitually coated tongue and rarely possessed a vigorous appetite. There are no constant gastroenteric symptoms. There were no constant urinary changes. By observation and acquaintance with the peculiarities of a great many cases, it was demonstrated that these children bore cow's milk fat badly. In not a few cases it was given in but small amounts or did not agree. It was also found that these children bore sugar badly, attacks being precipitated by free indulgences. The influence of butter fat and sugar were also shown by the gratifying relief of the patient when these substances were largely removed from the diet. There appeared to be a faulty oxidation, the child showed but a limited capacity for the oxidation of these high carbon foods: their complete conversion into energy, C. O. and metabolic water were not possible, intermediary, at present, indeterminate toxic products were the outcome which became manifest in different ways and one of these ways appeared to be a lessening of resistance or an establishment of an unusual irritability upon the respiratory tract.

These cases are similar to other periodic illnesses, such as recurrent vomiting, recurrent periodic fever with acetonuria, recurrent eczema, in that the attacks are more apt to occur during the colder months, when the elimination by the skin is less active and when muscular exercise is more in abeyance.

Among 141 cases of recurrent vomiting 41 per cent. suffered from recurrent colds.

The so-called catching of cold because of cold and inclement weather is much less a factor in these than has been supposed, because when the patients are fed and managed right, the weather has but little influence, just about as much as it has in a periodic fever, with acetonuria. Again not a few of these cases will have the periodic colds during the summer as in Case II.

In short, we have demonstrated clinically that these cases of recurrent coughs with bronchitis, usually with spasm, are the result of a systemic intoxication, due to the use of certain food substances which the organism is incapable of properly accommodating. As an associated factor, in defective skin elimination an absence of adequate muscle exercise is contributory.

I have had to treat a great many of these cases during the past few years and while I have met with flat failures, in the vast majority of cases, probably 95 per cent., the results have been most gratifying.

Management: Believing that our trouble basically is largely a matter of food intoxication, of a definite type, the source of the intoxication is removed. The average child after the sixth year receives two or three times as much energy food as he requires.

Milk and sugar are not indispensable for any child after the fifteenth month. I have brought up several children without cow's milk allergy and they differ in no way today in their development from other children.

Cane sugar was not cultivated until three hundred years ago, and as late as the sixteenth century it was used largely as a condiment, as honey is used at the present time. Countless millions existed and lived their span without it. Now we require forty pounds a year *per capita.* It requires no great strain upon the imagination to believe that the introduction of so large an amount of a highly energized food in excess of demands might produce ailments of a very definite character.

In an elaborate treatise on sugar, published in 1800, Benjamin Moseley quotes a statement of Theophrastus, who lived 321 B.C., explaining that "the generation of honey is not only from flowers, but also from canes or reeds." Moseley thereupon cites the writings of numerous celebrities (including Nearchus, Alexander's admiral, Varro, Dionysius Afer, Strabo, Seneca Lucan and Pliny, and covering a period from 325 B.C. to the end of the first century of our era) to show that the sweet juice of the cane was appreciated as a beverage and flavoring agent in Egypt and India long before the actual manufacture of sugar was evolved. From the East sugar in some form was early brought to Europe, and before the discovery of America, cane sugar was made on a considerable scale in the islands of the Mediterranean. From Spain and the Canaries, in turn, cultivation and manufacture from the cane were later extended to the West Indies and Brazil.

It is noteworthy that as the refined product came into common use, it was first employed only in medicine "to render unpleasant and nauseating drugs grateful to the sick." Gradually sugar was found of value in preserving fruits, and then added to tea, wine and various beverages until its acceptability as food for the sick and its value as a source of energy in sustaining artificially fed infants came to be appreciated. Then only (about 1600) was the substance commonly recognized as a food.

What the end result has been cannot be better summarized than in the words of Moseley written in 1800: "Two centuries have elapsed since it can be properly said that sugar has become an ingredient in the popular diet of Europe. Such is the influence of sugar that, once touching the nerves of taste, no person was ever known to have the power of relinquishing desire for it."

The recurrent bronchitic patients are cut off from sugar largely, entirely if the case promises to be difficult. Cow's milk is omitted entirely if the case is obstinate or skimmed milk is allowed. Time and again, I have seen children three to six years of age gain from three to six pounds after removing sugar from the diet and giving milk skimmed or none at all. An apparent handicap was removed, they would take more of other food and assimilate it. The carbohydrates and fats as found in vegetables, cereals and bread stuffs and meats supply all the heat and energy required.

Clothing: I usually advise that medium-weight underclothing or linen mesh be used. The child is given a warm bath at bedtime, followed by a vigorous rubbing and sometimes massage.

Inasmuch as the so-called lithemic type is the individual most frequently affected, I give such children interval treatment with bicarbonate of soda alone or with the salicylate of soda.

Bowel Function: If habitual constipation is present, a free daily evacuation of the bowels is insured by suitable treatment.

I will now present a few private cases whose mothers have kindly consented to come here:

Case I. This girl, six years of age, is a resident of Bay Ridge, Brooklyn. She came to me in October, 1912, because of attacks of bronchial asthma. The child had always been subject to frequent colds and during the year previous to coming under observation there had been frequent and severe attacks of bronchitis with asthma. In fact, there was almost constant bronchitis with exacerbation, so that there was very little time free from bronchitis, and it was almost as troublesome during the summer as in the colder months. At the time of the examination there was impeded breathing due to bronchial spasm. The appetite was poor. The child was fairly well-nourished. The diet was that of the average child of six.

She was habitually tired and decidedly irritable. She was given a diet largely sugar-free and one pint of skimmed milk daily. Otherwise the food was that of an average child of six. The medication consisted of Liq. Potassi ars. gtt i ss, and bicarbonate of soda gr. viii, three times a day for one month, and then this dosage was given on the alternate five days until July, 1913, when the medication was given five days with ten-day intervals of rest. In August, 1913, the first attack under treatment occurred. There was a sharp attack of asthma with hard cough but without fever. The day before the seizure she had been on a long sail with unusual fatigue. She was then given ten grains bicarbonate of soda three times a day for five days in alternation with the arsenic and bicarbonate of soda. In October, 1913, there was a slight attack, keeping the child in the house for two days. Salicylate of soda, gr. iii to the dose, was then added to the arsenic and bicarbonate of soda mixture and given for ten days with a five-day rest period. In February, 1914, there was a cold with cough and some wheezing for three days. The mother volunteered the information that the colds came on when the medication was discontinued. The child developed a cough in April, not enough to confine her to the house. The child has passed through the present winter, 1913-1914, with but three days indoors and from 1912 to 1913 with eight days indoors. This, in comparison with her former record of persistent bronchitis with acute exacerbation, makes the result a most satisfactory one.

CASE II. This girl, six and one-half years of age, came to me in October, 1913. She is a resident of Westchester County. She was fairly well-nourished. Examination showed moderate bronchitis. The child came because for the past six months she had attacks of bronchitis with asthma about every ten days, the longest period free from an attack being one month. She was irritable and hard to manage. During the ten days preceding her visit to me, there had been three sharp attacks and remissions. She was given a sugar-free diet and skimmed milk, one pint daily was allowed. Saccharin was used for sweetening purposes. Medication was as follows: Soda bicarbonate, gr. viii; soda salicylate, gr. iii; three times a day. In November there was one attack of asthma lasting four days. In December she had one attack lasting one hour. In January one attack lasting one hour.

Medication reduced to three times daily at alternate five days.

Attacks up to date: None since January except one slight head cold. Gain in weight during this time has been 5 pounds. The mother tells me that she has not had the usual colds of other children in the family.

CASE III. This boy was five years of age when I saw him. There had been practically a continuous cold for the past two winters. He was seen first on May 31, 1913, with the story that since November, 1912, there had been practically continuous bronchitis. Both tonsils were enlarged and a moderate adenoid growth was present. He was given a reduced sugar and reduced fat diet and ten grains bicarbonate of soda three times a day. He was seen again in October, 1913. The bicarbonate of soda had been given rather irregularly during the summer. The boy's condition had improved, having gained 2¼ pounds in weight. In November, 1913, there were two slight head colds, each lasting one day. During the entire six months that have intervened, the boy has been entirely well without medication, but the mother has adhered very closely to the diet, giving skimmed milk, eight to sixteen ounces daily and no sugar. The tonsils and adenoids were not removed. During the winter and spring months of the preceding two years there had been chronic invalidism.

CASE IV. This boy consulted me in January, 1912, when six years old, because of continuous colds and coughs and attacks of bronchial asthma. This condition had existed for three years. The respiratory explosions occasionally were varied with attacks of recurrent vomiting, and periodic fever. In February adenoids and tonsils were removed with the hope of alleviating some of the symptoms. Some improvement followed the operation, but in November, 1912, I again saw him and the story was that of the former trouble returning worse than before. The seizures were represented in repeated asthmatic seizures and a most severe persistent cough was most distressing. The diet and treatment suggested had not been carried out. I explained to the parents that I was much interested and would treat the child gratuitously if they would follow directions absolutely. At the time the boy weighed 55 pounds. Red blood cells were 4,300,000 and hemoglobin 60 per cent. He was given reduced fat and sugar diet, skimmed milk and very scanty sugar was allowed. He was given three grains salicylate of soda and eight grains bicarbonate of soda three times a day, with five-day intervals of rest. For tonic purposes he was given one-half grain Parke & Davis's thyroid extract twice a day. On April 3, 1914, he weighed 61 pounds, having gained 6½ pounds in four and one-half months on the reduced diet. He has not been ill in bed all winter and has missed not one day in school. In fact, the entire habit of life of the child has been revolutionized.

CASE V. A girl aged eight years was brought to me by Dr. Bernstein on January 21, 1914. (She is unable to be here because of an accident.) For the past five years there had been almost a continuous cough, often attacks of bronchitis, one attack followed very soon by another. For three years she "coughed almost incessantly at night." The child's general condition was fair. The chest examination showed bronchitis of the asthmatic type, delayed inspiration, prolonged expiration and many mucous and sibilant râles, a very familiar picture. The child had eczema and urticaria repeatedly and showed scratch marks involving most of the trunk. There have been repeated periodic vomiting seizures with high fever as high as 105° F. The breath is usually offensive, tongue habitually coated.

Treatment: Absolute sugar-free diet, saccharin used instead. Skimmed milk only. Given Liq. Potassi ars., gtt 1½; soda salicylate, gr. iv; soda bicarbonate, gr. viii; three times a day continuously. Pine-needle oil vapor used at night.

On February 4th the history states that the cough ceased gradually after beginning treatment. No bronchitis or fever. There has been one attack of hives. Medication reduced to two doses a day.

Child not seen until April 25th. History as follows: No cough since last visit until the past week. Now coughing a little at night. Mother thinks she caught a cold. No medication the past two weeks. Out of doors every day since early in February. Previously was kept in a greater part of the time because of the continuous colds. Gained ¾ pounds in weight. Tonsils and adenoids were removed two years before without improvement in colds. Mother states that child is better than ever before in her life.

CASE VI. This girl, aged seven and one-half years, I saw at her home on January 30, 1914. I found her in bed, where she had been a greater part of the time since November 1, 1913. She was indoors from November 1st to Christmas but for two weeks. Then she had another cold and had been in bed until my visit. She was well-nourished but pale. The colds and bronchitis had been very troublesome for three and one-half years.

There was but little bronchitis at the time of my visit, but there was a severe cough. The only other complaint was indefinite muscle pains.

The child had been getting whole milk, ice-cream and sugar freely. These were all discontinued and she was given skimmed milk, and saccharin instead of sugar. The cough ceased promptly and the rheumatic pains subsided. For the three months, February, March and April, the girl has been perfectly well and out of doors every day. She has gained 1½ pounds in weight. There has been an 8 per cent. increase in the hemoglobin and 500,000 in the red cells. The diet has been rigidly adhered to.

The medication consisted of three grains salicylate of soda in eight grains of bicarbonate of soda, both of which were discontinued after one month.

CASE VIII. This girl, eight and one-half years of age, was brought because of repeated colds of not a very severe type, but seriously interfering with school duties. These have entirely ceased. There has been no sign of trouble since January, when the treatment was instituted, and no loss of time at school. She was given the salicylate and bicarbonate treatment with a scant sugar and non-milk diet. In three months under treatment she has gained 3 pounds in weight on the so-called starvation diet.

A noticeable feature of these cases is the improvement in weight, blood and the general physical and mental condition of the patient. The child feels bodily well, a handicap has been removed and he is well and naturally happy. In about 50 per cent. of this type of patient the adenoids and tonsils have been previously removed.

THE EFFECT OF SUGARS ON THE GASTRIC SECRETIONS IN INFANTS.*

BY DE WITT H. SHERMAN, M.D.,

AND

HARRY R. JOHNES, M.D.

When we started the study of gastric analysis in infants a few years ago, we unfortunately did not plan for the rather extended investigations we have tried to make of the different food elements in the infant's diet. Had we appreciated at the start how far our studies would lead us, our plan would have been more comprehensive, and we would have avoided some little discrepancies which would have made our tests a trifle more harmonious. For instance, in comparing the effect of goat's-milk modifications to that of cow's-milk modifications we were indifferent to the effect on the stomach of the sugar content of the food.

In our last research we find there is a difference, which we will show.

Our technique in all our series of cases has been the same. In this series the testing of the three sugars, namely, the milk sugar, cane sugar and malt sugar, we used fifteen babies. Each baby was tested on each of the three sugars. The sugars were all in a 6 per cent. solution in a similar barley-water mixture.

As in other series of tests, the gastric contents were withdrawn one hour from the middle of the taking of the meal.

In this series, as in our two former ones, we gave the averages.

The amount ingested by the babies of all three sugar solutions averaged exactly the same, *i.e.*, 144 c.c. The amount recovered varied some. Of the milk sugar solution it averaged 23.30 c.c., of the cane sugar solution 34.40 c.c., and of the malt sugar solution, using Mead's dextri-maltose, 33.40 c.c. The last two, as you see, were virtually the same, but of each about 50 per cent. more was recovered than of the milk sugar solution.

Whether we can infer from this that the milk sugar solution passes on more rapidly than the other two solutions we are not prepared to say. We doubt it, though, for did the milk sugar solution stimulate to greater activity the motor function of the stomach we would naturally expect it to also stimulate to greater

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* Read before the New York State Medical Society, Section on Pediatrics, April 28, 1914.

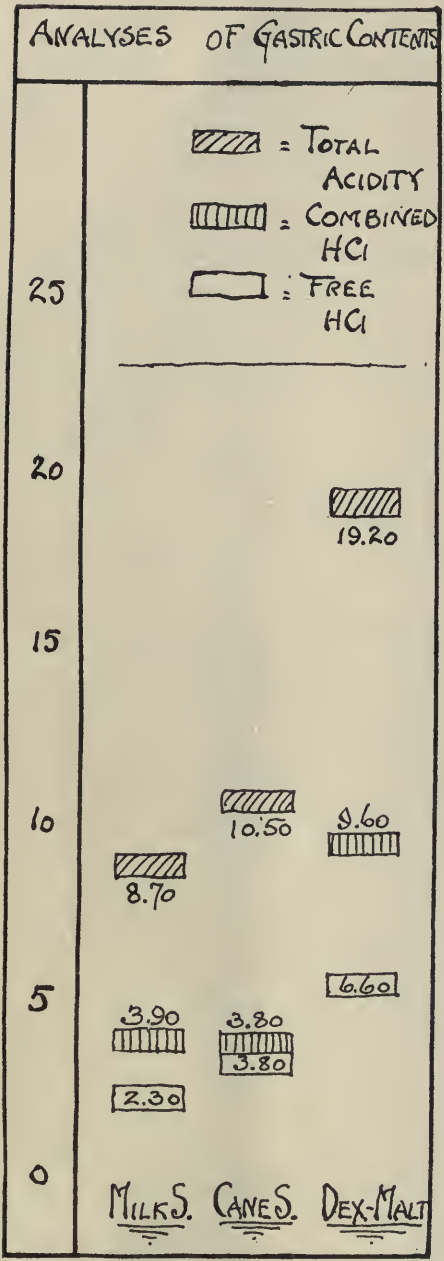


Chart Showing the Acidity of Gastric Contents of Children fed on Milk Sugar, Cane Sugar and Dextri-maltose.

activity the secretory function. This it does not do.

We are naturally pleased to see how closely our second series of 15 cases on barley water with milk sugar compares with the first series made three years ago. Our first series, which we made with the idea of establishing, if possible, a useful standard of gastric secretion in infants, reads:—

Free HCl., 2.10. Combined HCl., 5.60. Total acidity, 9.00.

Our second series reads:—

Free HCl., 2.30. Combined HCl., 3.90. Total acidity, 8.70.

The only difference, as you see, lies in the combined HCl. As there is a difference in this one respect we have combined the two, and we deduce from a series of 30 infants our standard to be:—

Free HCl., 2.20. Combined HCl., 4.75. Total acidity, 8.85.

We find that the cane or granulated sugar solution stimulates gastric secretions a little more than the milk sugar solution, and that the malt sugar solution, in the form of dextri-maltose, is more than twice as stimulating as the milk sugar solution.

This last fact may be of some importance to remember in those infants with hypersensitive stomachs.

Our averages then for the three sugars are as follows:—

	Free HCl.	Combined HCl.	Acid Salts.	Total Acidity.
6% milk sugar solution in barley water	2.30	3.90	2.20	8.70
6% cane sugar solution in barley water	3.80	3.80	3.00	10.50
6% dextri-maltose solution in barley water	6.60	9.60	3.00	19.20

The infants tested averaged in age about seven months. The youngest was three weeks and the oldest was eighteen months. The very youngest ones ran an average a little higher than our standard. The oldest, eighteen months, ran a trifle below our standard average.

Conclusions:—

(1) The average gastric analysis of infants deduced from 30 infants reads:—

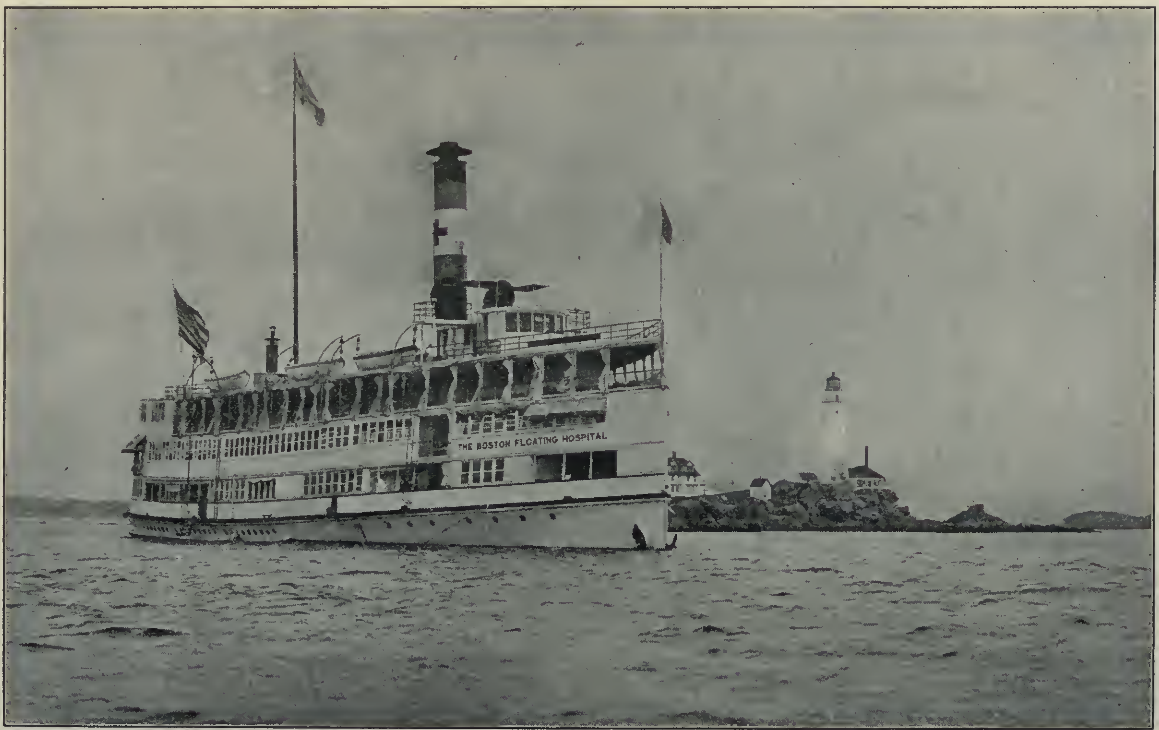
Free HCl., 2.20. Combined HCl., 4.75. Total acidity, 8.85.

(2) Cane sugar is only slightly more stimulating to the stomach than milk sugar.

(3) *Malt sugar in the form of dextri-maltose is at least twice as stimulating to gastric secretion as either milk or cane sugar.*

680 West Ferry Street, Buffalo, N. Y.

Immunity of the White Rat to the Diphtheria Toxin.—A. Pettit (*Gaz. des Hôp.*) reported before the Société de Biologie that this animal possesses a resistance to the diphtheria toxin to an extent greater than any other mammal. Whereas a dose equal to one fifteen-thousandth of the body weight kills in less than forty-eight hours, it is necessary to give an amount exceeding one one-hundredth of the body weight to accomplish this result in the rat. This resistance is the result of the natural immunity of the bodily cells.—*Medical Record.*



The Boston Floating Hospital.

THE BOSTON FLOATING HOSPITAL.

BY J. HERBERT YOUNG, M.D.,

Newton, Mass.

In the summer of 1893, Rufus B. Tobey, appreciating the lack of facilities for the care of sick babies in Boston, set out to stimulate interest in the organization of a Floating Hospital, patterned on that of the St. John's Guild of New York City. As a result of his labors, five trips were made during the summer of 1894 and a total of 1,100 children were given the benefit of a day's medical treatment and outing on the waters of Boston Harbor. One season was enough to demonstrate the need of such an institution, and the generous response of the public made possible one trip each week in 1895, two each week in 1896, and one each day in 1897 between mid July and late August.

In caring only for day patients the boat was only partially fulfilling the duties of a hospital; so when, in 1898, the barge Clifford was purchased and refitted, accommodations were provided for twenty-four permanent patients, receiving treatment both night and day, and a permanent house staff of physicians and nurses was established. This was the beginning of the Boston Floating Hospital as now organized: a hospital for infants and young children, both day and permanent patients, complete in itself with no on-shore hospital affiliations.

The present boat, entirely new and built with its functions as a hospital always in mind, went into commission in August, 1906. This boat is 171 feet long, 44 feet beam, and has a capacity of 120 permanent patients, 120 day patients and the same number of mothers. It is equipped with two fore and aft compound condensing engines, making us no longer dependent upon tug boats; steam-heating, refrigerating and electric-lighting plants, and laundry. Upon the main deck are the office of the resident physician and a general executive office, the food laboratory, a permanent ward of twenty beds, clinical laboratory, linen room, nurses' locker room, pharmacy and dining rooms for physicians, officers and nurses. The second deck is devoted entirely to the permanent patients. There are six wards of from fourteen to twenty beds, each with a bath and service room. In addition to the wards there is a room especially fitted for colon irrigations, a

Ward for Permanent Patients.

small isolation room, and a sterilizing room. This room is also provided with facilities for emergency surgery, although when possible, surgical cases are transferred to on-shore hospitals. The after ward is entirely open, canvas curtains offering the only, but ample, protection against wind and rain. The upper deck, except for the nurses' rest room forward, and the house officers' quarters aft, is devoted to the day patients. This deck, like the after ward, is entirely open.

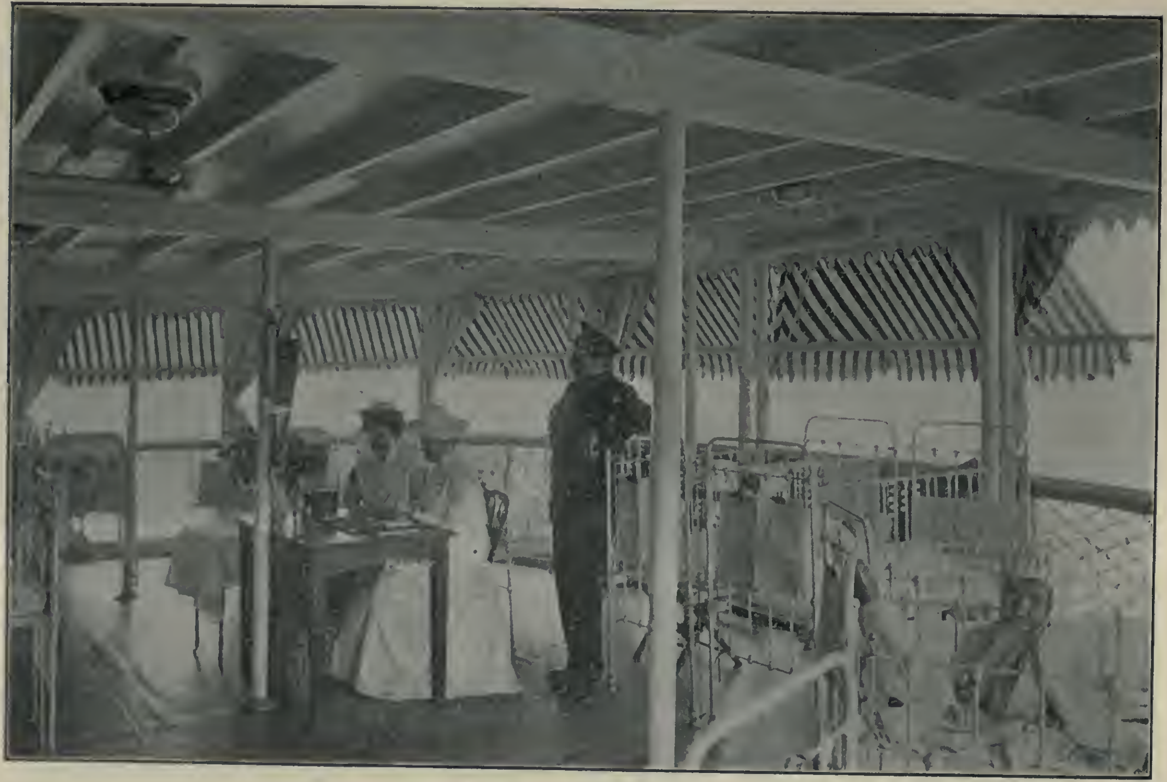
The Floating Hospital season begins the last of June and ends the middle of September. Trips down the harbor are made daily. The boat docks at one of the piers at North End Park. Permanent patients may apply here for admission between 7 and 9 A.M.; day patients between 8 and 8:45 A.M. The age limit is five years, no contagious diseases are admitted, nor are surgical conditions requiring immediate operation. Patients are met on the pier by house officers, especially assigned to this duty, the history taken and enough of a physical examination made to exclude contagious diseases. Mothers or attendants, and one well child under five years, if unable to be left at home, are admitted to the day patients' deck. All articles of food or drink for either mothers or patients are contraband, the hospital providing the noon-day meal for mothers and well children.

At 9 A.M. the boat starts down the harbor and anchors for the day, the length of the trip and anchorage depending upon the tide, wind and weather. At 4:30 P.M. the boat is back at the pier and the day patients leave. Any day patient for whom it is impossible to get clean milk or who requires a complicated modification, is given enough milk to last until the next morning. From 4:30 to 7:00 P.M. permanent patients are admitted and visitors allowed in the wards. At 7:30 P.M. the boat pulls out into the stream and anchors for the night.

Hospital statistics for the past five years show the following:

	1909	1910	1911	1912	1913
No. permanent patients .	384	462	438	336	348
" days' treatment	7,367	7,519	7,582	6,831	6,323
" day patients	667	929	800	702	674
No. days' treatment	4,683	5,702	5,125	5,873	4,323
Total number of days' treatment, including mothers and well children	17,665	19,668	19,287	18,301	16,247

Food Laboratory.



Open Ward for Permanent Patients.

The food laboratory is under the supervision of the director of the Boston laboratory of the Walker-Gordon Laboratory Company and maintains their high standards. The room is finished in white with a white tile floor. In the center of the room is a rack with large cans containing the stock hospital modifications, whole milk, fat-free milk, barley water, etc. From the bottom of each there is a rubber tube with a stop cock allowing the milk to be drawn directly into the nursing bottle. These cans are surrounded by refrigerating coils and are so arranged that they can be sterilized by live steam. All the milk used is certified. For stock hospital modifications the formulæ of the Milk and Baby Hygiene Association milk stations are used, so that a baby may continue on the same formula after leaving the hospital. Just before feeding time the head nurse in each ward sends to the laboratory an order for each individual feeding. This order is written on a piece of paper at one end of which is a hole large enough to admit the neck of a nursing bottle, and shows the ward, bed number, and the amounts of the various ingredients in the mixture. These pieces of paper are placed on the bottles in the laboratory so that each prescription is always directly before the eyes of the modifier. Nipples are put on in the laboratory and the bottles sent to the wards in pails of warm water. Nurses are not allowed to touch a nipple and if another is needed the bottle must be returned to the laboratory. Over 1,600 feedings have been put up in one day, the average being about 1,000. All bottles are sterilized by live steam in a room between the washing room and laboratory.

The medical organization of the hospital consists of a consulting staff, a visiting staff of four physicians and two assistant physicians, an auxiliary staff made up of eleven specialists, and a resident physician. In addition there is a bacteriologist and a biological chemist who devote their entire time, their work being almost wholly research. The permanent wards are divided into two services, each with three house officers. The day patients are in charge of two externes with several student assistants.

The investigations of the staff appear in two bulletins published by the hospital, and in the *Boston Medical and Surgical Journal* for March 2, 1911, and November 20, 1913. This work has been chiefly a study of infectious diarrhea. The appointment of Arthur I. Kendall, in 1910, as bacteriologist, improved clinical records, and an increased number of autopsies have re-

Day Patients' Deck.

sulted in a large amount of bacteriological, clinical and pathological data. Clinically, infectious diarrhea presents a perfectly definite picture; bacteriologically, this disease may be divided into two main groups—cases in which the dysentery bacillus and cases in which the gas bacillus are the etiological factors. Treatment depends upon the organism found. Cases due to the dysentery bacillus are no longer given nothing but sterile water for days, but after twenty-four hours are given a 5 per cent. solution of lactose until the temperature is normal and blood has disappeared from the stools. In extreme cases a 2.5 per cent. solution of dextrose (Kahlbaum's) in normal salt solution is given subcutaneously. The feeding of sugar provides an easily assimilated food for the infant, and a food which the dysentery bacillus may utilize, thus sparing the body proteins and preventing toxemia. The gas bacillus, on the other hand, flourishes on sugar, so these infections require a food containing a low sugar and a high protein. In spite of the fact that such treatment may seem to rest on purely theoretical grounds, clinical proof of its soundness has been given repeatedly, for the dysentery cases invariably do badly when given food high in protein, as do the gas bacillus cases when given lactose solution. Observation of cases from year to year shows a marked seasonal variation not only in the type of organism, but in varying degrees of virulence of the same organism. It has also been noted that the type of infection that makes its appearance in August is usually the predominating infection the following summer.

The nursing is done by a staff of from sixty to seventy graduates. The hospital offers a post-graduate course, which includes lectures by the staff, food laboratory work, ward and class instruction. Finally, the hospital boasts that department without which no hospital can hope to do efficient work, a social service department. This department has been of inestimable value in following up cases after discharge, in teaching mothers how to keep their babies well, and most of all in obtaining breast milk for babies in the wards.

THE ROENTGEN RAY AS A DIAGNOSTIC HELP TO THE PEDIATRIST.*

BY L. E. LA FÉTRA, M.D.

The value of the X-ray as an aid in the diagnosis of all surgical conditions that involve the bones and joints is too well known to require comment. Moreover, the use of this means of examination for diagnosis of chest and abdominal conditions in adults has become part of the routine of every large hospital, and the results have been gratifying in proportion to its greater employment and to the wider experience of the operators. With children the earlier Roentgen negatives were not so satisfactory, but with increased experience and a better knowledge of the technique of exposure, this method of examination has now taken its place as one of the most valuable of our means of diagnosis in infants and young children. Its usefulness in bone and joint conditions, such as fractures, dislocations, rachitis, chondrodystrophy, tuberculosis and syphilis, is thoroughly appreciated and requires no comment, but it is in reference to certain medical conditions in which the X-ray makes for us a positive or an early diagnosis, which would not be possible otherwise, that I wish to speak. I shall mention only such conditions as have come under my personal observation and I have asked Dr. Hirsch to show typical examples of the conditions mentioned, the cases being taken from the Children's Service at Bellevue Hospital. It is only just to Dr. Hirsch to say that much of our success in the early treatment of these obscure cases has been due to his skillful work and interpretation of the plates.

Enlargement of the thymus gland has been found several times simply as an incident of the thoracic examination when there was no cause to suspect it. Moreover, the frequent fallacy of percussion in the diagnosis of enlarged thymus has been demonstrated by the X-ray.

One of the greatest aids furnished by the X-ray, not only in diagnosis, but in lite-saving treatment, is the detection of foreign bodies in the bronchi. Such cases usually give signs of bronchopneumonia or of empyema complicated by pneumonia, and it has happened several times that the plate taken for the purpose of showing the extent of the empyema has revealed a foreign body in the bronchus as the cause of the broncho-pneumonic abscess in empyema. This has directed the treatment along proper lines and has proved life-saving.

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* Read before the New York Academy of Medicine, Section on Pediatrics, May 14, 1914.

For the detection of abscess of the lung and for the localization and determination of the extent of empyema, the X-ray is, of course, of the greatest value.

Recently our attention was called by Dr. Mason to his experiences at the Presbyterian Hospital in the diagnosis of early pneumonia. For several months it has been our practice to have plates taken of all infants showing high fever and rapid respiration, and my experience agrees with Dr. Mason's. In some of these cases, pneumonia was not suspected. In most of the cases the diagnosis of pneumonia was made from the general condition and the pulse respiration ratio; but it was impossible by physical signs to localize the disease. The X-ray plate shows with great delicacy the beginning of consolidation. In some a band or patch appears near the root of the lung, and extends outward toward the surface. In others a thin layer of consolidation is shown in the scapular region. The explanation of the failure of physical signs is quite easy when one looks at these plates. We have had some beautiful examples showing different phases of this early stage. Formerly I was skeptical about the existence of a pneumonia without physical signs; the X-ray shows, however, that the condition may exist in the early stages of lobar pneumonia.

Pneumothorax is another condition which is shown most beautifully by the X-ray, and the plate may confirm or even make a diagnosis otherwise unsuspected.

With regard to another lung condition the X-ray has proved of the greatest value, for without it frequently the diagnosis could not possibly be made. I refer to miliary tuberculosis of the lung. The X-ray and the von Pirquet test have transferred this diagnosis from a region of suspicion or conjecture into a realm of certainty. Before the perfection of the X-ray technique in the examination of the infant's thorax, we could only suspect the presence of miliary tuberculosis of the lung from the failing general condition of the patient, from the dry, hacking cough and the few evanescent râles heard most frequently in the nipple regions. The advent of the von Pirquet test made us more certain of the diagnosis, but the X-ray examination in skillful hands has given us ocular demonstration of this disease and a much earlier diagnosis than was formerly possible.

In addition to the miliary type of tuberculosis of the lung, two other varieties have been shown, one apparently a tuberculous broncho-pneumonia without consolidation and the other a tuberculous pneumonia or bronchopneumonia with marked consolidation. Often unsuspected cavities have been found, usually near the apex and in very young infants. The reason for the failure to suspect cavity from physical signs is probably due to the slight variation between the broncho-amphoric breathing of a cavity and the normal exaggerated puerile breathing heard in a small baby. Moreover, the small size of the cavities or the fact that they may be filled with mucopus, probably prevents the exhibition of characteristic physical signs. In some instances, even after having the X-ray plate as a guide, careful percussion and ausculation failed to reveal the condition, which undoubtedly existed. I recall one such instance in a premature baby weighing about four pounds.

For the diagnosis of pericardial effusion from cardiac enlargement, the X-ray is of the greatest service. Moreover, it is of great help in showing us the best places for puncture of the pericardium, and it also enables us to follow with greater accuracy the increase or diminution in the amount of pericardial fluid.

In the study of the alimentary tract the X-ray gives valuable information with regard to stenosis of the esophagus, especially where this is spasmodic or cicatricial, and it may also prove of value with regard to the stenosis of the pylorus with regard to kinks in the intestine or the presence of megacolon. With reference to pyloric stenosis I think, however, that the X-ray is not at all essential and it is often misleading. Other methods are of greater value and are universally available, namely, the use of the stomach tube to find out the amount of retention and the observation of the stools, the weight and the general condition of the baby. These give us more valuable information, in my opinion, than does the X-ray plate taken after the bismuth meal.

For the diagnosis of early bone syphilis and for the differential diagnosis of syphilis from scurvy and of syphilitic bone disease from tuberculous bone disease, particularly in cases of dactylitis or epiphysitis, the X-ray is of the greatest value.

REPORT OF THREE CASES OF DIABETES MELLITUS IN ONE FAMILY.

BY C. G. MOORE, M.D.,
Schuyler, Neb.

I find diabetes mellitus an uncommon disease for the general practitioner to have to treat. Many country doctors who have been practicing for a number of years have never seen a case, and even specialists in pediatrics see only 5 to 8 cases during a year.

CASE I. December 1, 1911, Mr. Mc., age forty, farmer, called at my office and gave the following history: A few weeks previous to his visit he had called a doctor out to his farm thinking he had the summer complaint and the doctor agreed with him. On consulting the doctor afterward, he informed me he had seen Mr. Mc. and had pronounced his case to be one of summer diarrhea, that he had some temperature, looseness of the bowels and weakness. At the time of the above visit at my office he complained of great thirst, frequent micturition, of dryness of the skin and loss of weight and strength. On examining his urine I found it to contain 5 per cent. of sugar. I told the patient frankly that I could not do much for him, but owing to his age, with proper diet and avoiding hard labor, he would probably live for several years. He obeyed my instructions, moved to town, retired, and now is getting along very nicely.

CASE II. On December 24, 1911, Mr. Mc. brought his nine-year-old son to me and said that he was afraid that the boy had the same disease as he and wished me to examine him. His symptoms were all positive, and on examining his urine I found it to contain 7 per cent. of sugar. I was again frank with the parents, and explained that owing to the age of the boy there was nothing that could be done that would save him as far as I knew. I advised strict diet, gave trypsogen, thyroid extract, etc., but the sugar percentage kept increasing up to about 15 per cent., and in March he died in coma. At this time I examined the urine of the three remaining children—two girls and one boy—and found them all negative.

CASE III. April 14, 1912, I was called to the residence of these same people to see their little seven-year-old girl. They gave me a history of her having felt bad for a few days and of having had some fever. On examining the child I found her to have a temperature of 102°F., but all my other findings were negative. I called the next day and found nothing present outside of the temperature, which was just the same as the previous day. I told them to keep her in bed for a few days and if her temperature rose to call me. In a couple of days they informed me that her temperature was normal and she was feeling all right, but she was passing a large amount of urine frequently and it left a sticky spot on the sheet. I examined the child's urine and found it to contain 7.2 per cent. of sugar.

This made the third case in one family and all started in suddenly with a fever, so that it looked like infection. I advised a strict diet, but the parents refused to adhere to it, saying that if there was no hope of curing her, only prolonging her life a few weeks, they were going to let her live in as much comfort as possible and not deny her anything. They would be perfectly willing to try anything that might prove a cure to her, but would not punish her by dieting her as they had the boy.

Having tried all methods of treatment in this family, and several others which I have had in the past few months, I decided to try autotherapy, for I have known cases of icterus which have failed to respond to all medicinal treatment, but cleared up in a very short time when they were given their own urine to drink.

I gave this little girl about 3 ounces of her own urine three times daily (first masking the taste and color) and then examined for the sugar percentage, and I found that when she was taking the urine the percentage of sugar dropped and that when it was withdrawn the percentage increased. I could also see some improvement in her general condition. She did not urinate so often or so much, did not drink so much water, her skin was more moist and she was not so nervous. She finally sickened of the urine and her parents did not continue the treatment and since then she has been growing worse, the urine at the present time containing 15 per cent. sugar, with traces of acetone. She has lived over my expectancy, for when I first saw her I gave her from six to ten weeks to live.

I referred this case to Dr. H. M. McClannahan, of Omaha, and it is on his suggestion that I am reporting these cases.

REPORT OF A CASE OF OTITIC MENINGITIS DUE TO THE STREPTOCOCCUS CAPSULATUS.*

Double Mastoidectomy, Followed in Two Days by Drainage Through the Cisterna Magna. (Haynes Operation.)

BY C. JOHNSTONE IMPERATORI, M.D.,
New York City.

The report of a case ending unsuccessfully from an operative standpoint is of value. While not adding to the reputation of the one making the report, we are of the opinion, with Dr. J. C. Beck, of Chicago, that "if we could only induce all to report their failures as well as their best results this branch of surgery (intracranial diseases) would rapidly rise in its usefulness."

The noting of the different phenomena incident to the onset of the disease may be correlated at an earlier period, thus arriving at a diagnosis sooner. The identification of the infecting organism; the period when the operation was done in relation to the other symptoms; the type of operation, and, eventually, the results—all these facts will aid and help in subsequent cases.

The history of the following case will be of interest:—

A. G. S., aged seven. Born in the United States in June, 1906, came under observation for the present illness December 13, 1913.

Family History.—Negative.

Past History.—Was a seven-months child and has always been in good health, excepting as follows:—

January 27, 1907. When nine months old had a discharge from the left ear. This cleared up under treatment (syringing) and attention to the nasopharynx within four weeks.

November 24, 1909. When three and a half years old had occasional discharge from the left ear, but syringing would clear it up within a few days or until the child would catch cold again. He is a mouth-breather. Advised the removal of adenoids and tonsils, which was done under ether. A large mass of adenoid tissue was removed and a tonsillotomy was done. At the time of the operation there was no discharge from either ear. The left drum showed thickening.

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* Read before the Benjamin Rush Medical Society, June 6, 1914.

December 12, 1909. At this time the patient had an OMPA left and an acute tubal catarrh of the right side. The left drum was incised through the perforation, located centrally. Within two weeks the drum was healed, the right side clearing up within a week.

January 20, 1910. The left ear has again started to discharge, after a very restless night. Incision was refused by the parents and the discharge continued through a small central perforation for seven months. When the child again was seen, there was evidence of adenoid tissue in the pharynx and the stumps of the tonsils had hypertrophied, so that it would appear that no previous operation had been done. It was advised that the tonsils be removed and also the adenoids.

On July 6, 1910, a large mass of adenoid was removed and the tonsils resected. The ear discharge ceased within a few weeks and the child remained well up to December 1, 1913. He never had any ear or nasopharyngeal trouble for three years following the last adenoid and tonsils operation.

Status Præsens.—The present history dates back for the past two months, during which time the mother has noticed that the child did not seem to be in as good physical condition as formerly. He would complain of occasional headache on the left side. About the 1st of November he had a very slight watery discharge from the left ear, but this cleared up within two days under no treatment. About December 1st he vomited and was kept home from school, but was well enough to play around as usual.

December 8th. The left ear began discharging spontaneously, after having had a very restless night. At this time he had vague pains in and around the left ear.

December 10th. Seemed stiff, complained of pain in the right ear, slept only part of the night.

December 11th. Had a temperature, and family physician gave some ear drops and internal medicine.

December 13th. *Physical Examination.*—OMPA left, small perforation, located centrally, anterior inferiorly. The right drum was bulging. No mastoid tenderness over either side. Temperature was 102°. There was a very slight Kernig, with slight stiffness of the neck. No pupillary changes. No tache cerebrale. Sensorium normal. Sent to Red Cross Hospital where a double myringotomy was done, under nitrous oxide, early in the afternoon. The discharge from both ears shows streptococcus capsulatus. That evening the child seemed decidedly improved. Temperature, 101°. Pulse, 132. Respiration, 24.

December 14th. Temperature, 103°; pulse, 128; respiration, 24. By evening the temperature had dropped to 99°, with the same pulse and respiration. During the morning all the signs of early meningitis were present, and we decided to do a lumbar puncture, but on return call to the hospital in the evening all these signs had cleared up, an enema having been given early in the afternoon, and the bowels having moved freely. The temperature was 99°. No Kernig and cervical opisthotonos and from the fact that the child seemed so much better we decided not to do a lumbar puncture—for the time being. Began with urotropin, gr. x q. 3.h. The laboratory confirmed our diagnosis of streptococcus capsulatus.

December 15th. Nurse reports that the child slept well. Wants to eat and is anxious to go home and to go to school. Both middle ears are draining well. The incision in the right drum partially healed. The detail description of the appearance of both membrana tympani is as follows:—

Right.—Membrane is edematous, dark-red in color; incision, which was made in the posterior segments, healed three-fourths of its length. Processus brevis not easily made out. Pus pulsating in the opening. No mastoid tenderness.

Left.—Membrane appears edematous, but not so red as the right side. Incision open—pus pulsating in the opening. Processes brevis easily made out. Throat and nose negative. No Kerning, no Brudzinsky, no cervical opisthotonos, no Babinski. Reflexes—patellar and abdominal normal. 4 P.M., temperature, 101°. General feeling about the same as this morning, but on doing Kernig, there was a slight rigidity detected and the child complained of pain. Babinski present on the right side. Normal on the left.

December 16th. Nurse reports that he has slept most of the night, with occasional moaning. The right drum—the incision has almost healed. This was incised under nitrous oxide. Temperature, 100°; pulse, 100; respiration, 26. P.M.: Has passed a fairly comfortable day. Discharge from both ears has markedly diminished in amount, especially the left. By midnight the temperature was 103⅗°.

December 17th. Has slept about half of the night. There is slight amount of tenderness over the mastoid on the left side and almost none on the right. Neurological examination same as December 15th. Temperature, 104°; pulse, 140; respiration, 24. Advised double exploratory mastoidectomy, doing the left side first. At 5 P.M. a double simple mastoidectomy was done, with the following operative findings:—

Left Side.—The dura was found exposed about 5 by 3 mm. in the region of the tegmen antri. It appeared healthy. There was no exposure of the sinus. The cells at the tip and over the sinus were necrotic, showing recent invasion. A large cell situated at the knee of the sinus found filled with pus. However, most of the mastoid cavity was sclerosed.

Right Side.—The cells in the mastoid found mostly in a hemorrhagic state, with areas of cell necrosis and pus. Dural exposure was instrumental—about 8 by 5 mm. in the region of the tegmen mastoid. No exposure of sinus. Anesthesia was ether, by Dr. C. J. Pick. Time of operation one hour and ten minutes. Returned from the operating room in good condition. 8 P.M.: Temperature, 100°; pulse, 110; respiration, 24. Resting quietly.

December 18th. Has slept mostly all the night. No nausea, no vomiting. Sensorium normal. Hungry and wants to go home. Temperature, 100°. 4 P.M.: Complaining of frontal headache. Vomited—projectile in character. Marked cervical opisthotonos. Brudzinsky and Kernig positive. Lumbar puncture was done four times with negative results. The fifth time, going between the fifth lumbar and the sacrum, there appeared a small drop of clear fluid. 8 P.M.: Same as described above with added details. Temperature, 104°; pulse, 134; respirations, 24. The child remains quietly in one position in bed, sleeping restfully. Marked pallor of the face. Can easily be aroused and shows a slightly cloudy sensorium. Pupils react to light normally. Eye grounds negative. Reflexes, Babinski right, not on the left side. Slightly diminished left knee jerk.

December 19th. Consultation with Drs. I. S. Haynes and S. J. Kopetsky. It was decided to do a lumbar puncture under gas, and follow with an exploratory operation of the left middle cranial fossa and then do a drainage of the cisterna magna. The reasons for arriving at the above decisions were as follows:—

(1) The positive signs of advancing meningitis, detailed above, to which may be added the following: Babinski has remained positive on the right and absent on the left. Diminished knee jerk on both sides. Oppenheim and Gordon sign positive on the right side.

(2) The dural exposure found at operation on the left side, in the region of the tegmen antri, led us to feel that this was the site of the infection of the meninges and that possibly we might find evidence of inflammation in the middle cranial fossa.

(3) Knowing the nature of the streptococcus capsulatus.

The child was taken to the operating room and under gas anesthesia lumbar puncture was negative. Five trials were made—twice by Dr. Kopetsky and three times by the writer. Exposure of the left mastoid wound, examination of the exposed dura, followed by further exposure of the dura and parallel incisions into the dura and exploration of the middle cranial fossa proved negative. The cerebrospinal fluid was not under tension in the region of the left middle cranial fossa. This part of the operation was done by Dr. Kopetsky and the writer. Exposure of the cisterna magna was done by Dr. Haynes, the author of this operation. On incision of the dura and pia-arachnoid over the cisterna, cerebrospinal fluid came out under pressure. The fluid was clear. A rubber tissue drain was placed in the wound down to the cisterna and the wound partially closed. Gas and ether by Dr. Fletcher. Time fifty-five minutes—thirty-five minutes for the lumbar puncture and exploratory operation and twenty minutes for the cisterna operation.

The child reacted well, and at 4 P.M. the temperature was 102°; pulse, 130, and respiration, 24. Cerebration slightly cloudy. No headache. General appearance about the same as the day before. 8 P.M.: Is conscious at times and cerebration apparently normal. Vomited several times. Cervical opisthotonos marked, also Kernig.

December 20th. Complained of headache during the night, crying out sharply at times. Sensorium is slightly cloudy and all the advanced signs of a terminal condition are present. During the latter part of the day had a slight convulsion; these increased in severity, pulmonary edema ensued, with coma and exitus the following day, December 21st at 1 P.M., fifty hours after the cisterna operation and four days following the mastoidectomy. Autopsy refused.

Conclusions.—In that the infection was a streptococcus capsulatus and that there was a dural exposure in the left mastoid cavity plus the fact that we know that this organism will stay dormant for a variable period, coupled with the history that there was a slight discharge from the ear that cleared up in a few days—a month previous to the onset of the active symptoms in the ear—and that the mother noticed that the child seemed to be failing for the past two months and had occasional headaches, all these symptoms were early signs of meningitis due to a latent middle ear suppuration and mastoiditis on the left side. The main indication for doing the mastoid operation was that the streptococcus capsulatus was present.

In a recent article by Dr. Dixon, of the New York Eye and Ear Infirmary, it is shown that this particular organism is a dangerous one to find in middle ear suppurations. The explanation of the ephemeral character of the Kernig, cervical opisthotonos and other neurological signs, I do not attempt. The negative results from lumbar puncture can only be considered as faulty technic, excepting the one time when a drop of clear fluid came out. It is possible that there was a blocking of the foramina of Magendie and Luscha. This might seem to be the case, in that the cerebrospinal fluid was found under tension, when the cisterna was opened. It would seem that this was a proper case for the Haynes operation before marked cerebral pressure was present and the vital forces of the patient were exhausted. In this case it was a decided failure, in contrast to cases where this operation was done late.

In these cases nearly all that have been reported were done after the patient was unconscious or semi-conscious and the rule has been that the relief of pressure of the cerebrospinal fluid allows a return of consciousness that remains for a variable period—from hours to days—again lapsing into unconsciousness and death.

In general, we are of the opinion that all ear discharges should be examined and especial attention paid to capsulated cocci. In these cases of otitic meningitis, as yet but one case has lived following the Haynes operation. We are still groping for more light and mainly because of lack of research, following the operation.

It is in these class of cases that necropsies should be allowed, and the fact that they are not allowed by the family or friends of the patient will be one of the most important restraining factors in our advance in solving the treatment of this dreaded complication of middle ear disease.

THE FEEDING OF MAL-NOURISHED INFANTS ON HIGH PROTEIN AND CARBOHYDRATES AND LOW FAT VALUES.*

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This paper lays no claim to be other than a clinical one; no metabolic studies or chemical researches are offered, or theories presented, as to the causes of chronic mal-nutrition in infants. Nor is there anything original in the method described as fairly successful in the writer's hands in the management of these all too common cases. The principles involved have been repeatedly employ, with more or less success, by many other observers; especially since the more recent conception of the rôle of the different milk constituents in the infantile digestive economy has found a place in the minds of physicians.

The feeding of marasmic and mal-nourished infants has ever been a stumbling block and reproach to pediatrists. The existence of these babies has contributed largely to the popularity of the proprietary foods; has strengthened the belief, still entertained by many, that there is and can be no successful or scientific artificial feeding—that it is all haphazard; and has made it so difficult, as many of us have found, to convince hospital managers that baby wards are worth the cost of their management, so disheartening are the results obtained therein.

The most successful method of nourishing infants in a state of mal-nutrition has been in the past, and now is, human breast milk; but it has taken the profession at large, and even pediatrists themselves, a long time to grasp the self-evident proposition: Entirely too much time continues to be wasted in finding a suitable food before wet-nursing is resorted to. Proprietary foods have always occupied a large place in the feeding of these babies, and it cannot be gainsaid by an unbiased observer that many apparently hopeless cases react surprisingly well to some of these preparations, particularly the condensed, dried and malted varieties; every one of us must have had this experience.

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* Read at the twenty-sixth Annual Meeting, American Pediatric Society, Stockbridge, Mass., May 26-28, 1914.

Curiously enough, mal-nourished babies are the ones in whom undiluted cow's milk has been most often successful, possibly because of its relatively low fat and sugar and high protein content. In recent times, buttermilk, albumin-milk and Keller's malt soup have been extensively and often successfully employed; but the most frequent method of dealing with these infants, particularly since the advent of percentage feeding, has been the exhibition of low fats and proteins and relatively high sugar values. Albumin-milk, just referred to, appears also to be of great value, but it is only applicable for brief periods, as a preparation for a more rational dietary.

When one scrutinizes the foods and methods of feeding which have been more or less successful in mal-nutrition and marasmus several points of importance will be noted, namely: The low fat, and, frequently, high carbohydrate content of these preparations, and the attenuated or altered state of the casein, even though the latter may not be present in high amount. Thus are explained the good results sometimes seen after condensed milk, albumin-milk, Keller's preparation and some of the proprietary foods, and thus is the way indicated for the employment of other and more generally applicable methods of feeding.

Whatever may be the essential condition that prevents mal-nourished babies from utilizing the food elements presented to them, they, in most cases, *at least at the time when they usually come under observation,* give marked evidence of an intolerance for cow's milk fat; not infrequently they are taking formulæ in which the fat is in amount suitable to their age and weight; quite often it is abnormally high, and yet the infant fails to utilize it and remains undersized and puny. Whether this failure is due to an inherent or acquired inability (through faulty feeding), or to the deleterious influence of the salts and lactose, and is, therefore, a secondary phenomenon, will not be discussed here. The fact remains that, while with normal infants there is usually little trouble in digesting cow's milk fat, with atrophic and mal-nourished babies it is frequently quite different.

Notwithstanding this, we have found that, after a period of low fat and high protein feeding, these cases can, in many, indeed, in the majority of instances, be rendered immune to the injurious influence of cow's milk fat by making minute increases at short intervals, until an amount sufficient for their nutritive needs is given and well borne. This point is important, as no child can be fed with impunity for prolonged periods on a fat-free diet. Dr. H. D. Chapin's* observations on the function of fats in nutrition and on metabolic water are most instructive in this particular.

When the fat is reduced to a minimum the protein may be increased relatively, and, in many cases, absolutely, to meet the nutritive and calorific requirements of the infant, as mere increase in the carbohydrates is not sufficient for this purpose. There seems to be no difficulty in the utilization of this element, especially when separated from the fat. Finkelstein's views on this matter are now so generally accepted that further discussion seems unnecessary. I, myself, am convinced of them. No protein injury (fever, etc.) is ever observed in the amounts advisable in ordinary cases of mal-nutrition; besides, in my cases the percentages of protein were never excessive, and were further protected by the whey in the milk, which Holt and Levene believe tends to prevent the so-called protein fever.

As is well known, proper gain in weight must, as a rule, be secured by the addition of carbohydrates, when the protein is given in safe and rational amounts. In the cases with which this paper deals maltose was the preferred sugar, but both lactose and saccharose were found useful, especially when dextri-maltose proved constipating, as is sometimes its tendency.

At no time did apparent harm result from the use of sugars, other than maltose, in under-nourished infants; indeed, it may be stated here that we very much doubt the activity of the sugars in this respect. Our experience is entirely clinical, but beyond fermented and acid stools, *readily corrected, usually,* we have not been impressed by the injurious effect of the sugars in infant feeding.

It was further discovered that in many of our cases more rapid increase of weight could be obtained, the nutrition of the infant better conserved and the stools take on a more natural appearance, if a small quantity of wheat flour (½ ounce to the quart of water, 1.5 per cent.) was added to the dietary. Usually this was dextrinized. The starch in these quantities caused no disturbance. "Starch injuries" were not noted. Occasionally more than one sugar was used: lactose and maltose or maltose and saccharose, as some infants seemed to thrive better when so fed.

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* *New York Medical Journal,* 1913, XLVII., 269.

Although the term "marasmic" is employed in the title of this paper, it should be stated that the actual cases of which it treats do not belong strictly to this category; not one exhibited the extreme wasting of marasmus or atrophy. The difference, however, was one of degree rather than of kind; all were much underweight—from 6 to 10 pounds—all exhibited the digestive disturbances, the nervousness, sleeplessness, the tendency to "colds" and adenoid growths so common in this class of infants.

METHOD OF FEEDING

Usually the infants were started upon a fat percentage of .50 per cent., with protein at two and one-half to three times, and carbohydrates ten to twelve times greater, *i.e.*, fat, .50 per cent.; carbohydrates, 5 to 6 per cent.; protein, 1.30 to 1.50 per cent. The fat and protein were then increased rapidly, every fifth, sixth or seventh day; the fat in tenths of 1 per cent., the protein in fifths or thirds of 1 per cent., while the carbohydrates were at once increased, if no gain in weight was noted, to 7.5 or 8 per cent. Not very marked gains were secured until the latter elements had reached these proportions. The protein was also rapidly increased, depending upon the weight curve, but rarely exceeded 3 per cent. This, however, bore a close relation to the length of time the infant was under observation, and was, until fat tolerance was more or less established, always considerably in excess of the former.

So soon as the baby had begun to gain well and the stools to become normal or nearly so (not before) an attempt was always made to increase the fat in the manner described (*i.e.*, fractions of per cent. every fifth, sixth or seventh day) until two or more per cent. was reached; and this was generally found feasible, provided the conditions stated above were observed, *i.e.*, after the stools were normal and infant beginning to gain. The quantities of food given were small at first, but it was soon found necessary to increase them to amounts somewhat above that required by healthy infants of the same ago, and very *considerably larger than that demanded by their weight.*

The calorific value of the food taken averaged from 60 to 65 per pound. A very few took 70 to 75, while others made good gains on from 45 to 50 per pound, of body weight. Here, as in normal babies, great differences were observed in this respect, demonstrating anew the uncertainty of this method of feeding as a routine procedure.

MODE OF PREPARING THE FOOD

All the patients were seen in private practice, and hence the preparation of the food was made as simple and as inexpensive as possible: Skimmed milk, containing from 1 to 1.75 per cent. of fat was the basis. When a flour gruel was the diluent, it was dextrinized. To this dextri-maltose, milk or cane sugar was added, as the individual case seemed to require. Sometimes one of the semi-solid malt extracts was employed instead of dextri-maltose (one ounce to the quart). Quite frequently the mixed skimmed milk, malt extract and flour were boiled for a moment, after the manner of Keller.

The results of this method of feeding were usually apparent at once: The stools, which had been very dry, crumbly and clay or light colored, or otherwise abnormal, became light brown and putty-like, gas and pain disappeared, and the infant, as soon as the protein and carbohydrates were sufficiently high, became more cheerful and less nervous and sleepless.

That a food so deficient in fat could be continued any length of time without detriment to the infant goes without saying. Not one of my cases was long enough without fat, or on low fat, to test this point. An attempt was early made to get them upon a more rational dietary, especially upon a fair proportion of fat; although this element in some of the cases followed had to be always kept below the protein of the formula.

The following are brief case reports of infants fed in the manner above described:—

CASE I. *History.*—C. C.: seven months; birth weight, 7½ pounds; present weight, 7 pounds; average weight for age, 17½ pounds; never nursed; fed upon proprietary foods and top milk mixtures; now gets equal parts milk and water, with a proprietary dextri-maltose, caloric value of which is 65 per pound; given skimmed milk, malt extract and flour brought to a boil; five to six loose, yellow stools daily. No regurgitation.

DATE:		Feb. 5.	Feb. 17.	Feb. 25.	Mar. 13.	Mar. 27.	Apr. 21.	May 1	May 20.
Percentages:	F.,	.50	.50	1.00	1.25	1.50	1.75	2.00	2.00
	P.,	1.30	1.50	1.90	2.20	2.40	2.75	3.00	3.25
	C.,	7.	7.	7.	7.	7.	7.	7.	7.
WEIGHT.									
Pounds		7	7½	7¾	8⅛	8 15-16	9 7-16	10½	11
QUANTITY.									
Ounces		40	42	42	46	48	50	50	50

Age at completion of treatment, nine months; duration of treatment, three and one-third months; gain, 4 pounds.

CASE II. *History.*—M. K.: four months; birth weight, 6¾ pounds; present weight, 8 pounds; average for age, 14 pounds; nursed one month; now takes: fat, 3.25 per cent.; proteids, 1.30 per cent.; carbohydrates, 5 per cent.; hard, dry, light-colored stools; given dextrinized gruel, skimmed milk and dextri-maltose.

DATE:	Nov. 13.	Nov. 18.	Nov. 24.	Dec. 1.	Dec. 8.	Dec. 15.	Dec. 21.	Dec. 25,
Percentages: F.,	.60	.70	.70	.80	.90	1.00	1.00	1.20
P.,	1.30	1.50	1.60	1.75	1.85	2.10	2.25	2.40
C.,	6.50	7.50	7.50	7.75	8.00	8.00	8.00	8.00
WEIGHT.								
Pounds	8	7 15-16	8 2-16	8 8-16	8 15-16	9 4-16	9¾	10¼
QUANTITY.								
Ounces	32	32	32	36	36	42	42	42
Calories: Per pound:	43	53						

DATE:	Jan. 1.	Jan. 6.	Jan. 11.	Jan. 16.	Jan. 23.	Feb. 7.	Feb. 14.	Feb. 21.
Percentages: F.,	1.25	1.35	1.45	1.55	1.75	2.00	2.25	2.25
P.,	2.50	2.60	2.75	3.00	3.00	3.25	3.25	3.25
C.,	7.75	7.50	7.50	7.50	7.50	7.50	7.00	7.00
WEIGHT.								
Pounds	10¾	11¼	11¾	12¼	12¾	12¾	13 1-5	13¾
QUANTITY.								
Ounces	42	42	45	45	45	45	45	45
Calories: Per pound:	60				65		60	

Age at completion of treatment, seven months; duration of treatment, three and one-quarter months; gain, 5¾ pounds.

CASE III. *History.*—M. H.; three months; birth weight, 6¾ pounds; present weight, 8 pounds; average for age, 13¼ pounds; nursed a short time; fed upon cream, whole milk and barley; now gets: fat, 3 per cent; protein, 1.30 per cent.; sugar, 6; 27 ounces daily; calories, 65 per pound; gas, pain; loose green, yellow stools; given dextrinized wheat gruel, skimmed milk and maltose (dextri-maltose).

DATE:	Feb. 27.	Mar. 5.	Mar. 10.	Mar. 17.	Mar. 30.
Percentages: F.,	.60	.60	.60	.75	1.00
P.,	1.30	1.50	1.75	2.00	2.00
C.,	6.	4.	5.	5.	6.
WEIGHT.					
Pounds	8	8¼	8 2-3	9	9½
QUANTITY.					
Ounces	32	32	36	40	40

NOTE: Sugar kept low because of sugar intolerance.

Age at termination of treatment, one and one-seventh month; duration of treatment, four and one-half weeks; gain, 1½ pounds.

CASE IV. *History.*—L. H.; five months; birth weight, 7½ pounds; present weight, 8 pounds; average for age, 15 pounds; nursed two months; fed on varying proportions of milk, water and cream; now gets 2.65 per cent. fat; 1 per cent. protein; 5 per cent. sugar; 46 ounces daily; calories, 71 per pound; hard, crumbly, light, clay-colored stools; cries continuously; given dextrinized wheat gruel, skimmed milk and a semi-solid malt extract, boiled for a moment.

DATE:		May 30.	June 5.	June 12.	June 21.	July 4.	July 14.	Aug. 12.	Sept. 11.
Percentages:	F.,	.50	.50	.60	.80	1.00	1.25	1.50	2.00
	P.,	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
	C.,	6.00	7.00	7.50	7.50	7.50	7.50	7.50	7.00
WEIGHT.									
Pounds		8 1-3	8¾	9 1-3	10	10½	11¼	13 2-3	15¼
QUANTITY.									
Ounces		48	48	48	50	56	56	56	56
Calories:									
Per pound:		65			75		75		

Age at termination of treatment, eight months; duration of treatment, three and one-third months; gain, 7 pounds.

CASE V. *History.*—M. A.; eight weeks old; birth weight, 5 pounds; present weight, 5¾ pounds; average for age, 11 pounds; never nursed; light yellow, dry, hard stools; regurgitation much (main cause of loss of weight); fed upon milk, cream and water mixture; now gets fat, 2.50 per cent; protein, 1.40 per cent.; sugar, 6 per cent.; 24 ounces daily.

DATE:		Mar. 12,	18,	25.	Apr. 1,	7,	14,	23,	30.	May 7,	14.
Percentages:	F....	.50	.50	.50	.60	.70	1.	1.10	1.25	1.50	1.75
	P....	1.40	1.50	1.50	1.50	1.65	1.75	1.75	1.75	1.75	1.75
	C....	6.	6.50	7.	7.50	7.50	8.	8.	8.25	8.25	8.25
WEIGHT.											
Pounds:		5¾	6	6 3-16	6 9-16	6 15-16	7¼	7¾	8¼	8½	9
QUANTITY.											
Ounces:		24	24	24	28	30	30	32	36	36	36
Calories:											
Per lb:		48					65		70		

Age at termination of treatment, four months; duration of treatment, two months; gain, 3¼ pounds.

CASE VI. *History.*—B. W.; four months; birth weight, 7 pounds; present weight, 8 pounds; average for age, 14 pounds; nursed two weeks, then weaned because of green stools; has had proprietary foods and milk mixtures; now taking: fat, 3.75 per cent.; protein, 2 per cent.; sugar, 4 per cent.; constipated; light-colored stools, alternating with loose, curdy ones; given skimmed milk, dextri-maltose and water.

DATE:		May 3.	May 5.	May 9.	May 25.	June 26.	June 29.
Percentages:	F.,	1.	1.	1.	1.25	1.35	1.50
	P.,	1.30	1.50	1.60	1.75	1.75	1.75
	C.,	6.	6.	7.	8.	8.	8.25
WEIGHT.							
Pounds		8	8 1-3	8¾	9	9 8-16	9¾
QUANTITY.							
Ounces		35	36	36	42	42	42

DATE:		July 1.	July 15.	July 21.	Aug. 6.	Sept. 16.
Percentages:	F.,	1.75	.50	1.	2.	2.
	P.,	2.	1.	1.50	2.	3.50
	C.,	8.25	3.	5.	7.	7.
WEIGHT.						
Pounds		10¼	9½	9	10	13
QUANTITY.						
Ounces		42	28	32	42	48

NOTE: Reduced weights 7-1 to 7.21 due to acute diarrhea.

Age at termination of treatment, eight months; duration of treatment, four months; gain, 5 pounds.

CASE VII. *History.*—M. H.; three months; birth weight, 5 pounds; present weight, 7 pounds; average for age, 12½ pounds; condition good; partly nursed and also a mixture representing fat, 3.00 per cent.; protein, 1.33 per cent.; sugar, 6 per cent.; 4 ounces after fifteen minutes of breast; very hard, dry movements, of good color; no gain for several weeks.

DATE:		Apr. 4.	Apr. 8.	Apr. 12.	Apr. 22.	Apr. 30.	May 12.
Percentages:	F.,	1.75	1.75	1.75	1.75	1.85	2.
	P.,	1.50	1.50	1.60	1.75	1.75	1.75
	C.,	7.	7.	7.	7.	7.	7.
WEIGHT.							
Pounds		7	7½	8 10-16	9 6-16	9 13-16	10 6-16
QUANTITY.							
**Breast*—* Ounces		3	3-3½	3-3½	3-3½	3-3½	3-3½
Bottle— Ounces		21	21	21	24	28	28

NOTE: This case does not properly belong to cases treated in this paper; is included to illustrate gain under low fat after high fats had failed.

Age at termination of treatment, four and one-third months; duration of treatment, five and one-half weeks; gain, 3 pounds, 6 ounces.

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* Amount taken approximately at each nursing, verified by weighing.

CASE VIII. *History.*—D. L.; seven months; birth weight, 6 pounds; present weight, 10 pounds; average for age, 17½ pounds; nursed six weeks, then put on proprietary foods and milk mixtures; movements green, with large fat curds; emaciated, constantly lamenting and sleepless; given skimmed milk, flour and semi-solid malt extract boiled together.

DATE:	Nov. 8.	Nov. 11.	Nov. 15.	Nov. 20.	Nov. 25.
Percentages:	F., .50	.50	.60	.80	.90
	P., 1.25	1.35	1.75	1.85	2.
	C., 5.	6.	7.50	8.	8.
			WEIGHT.		
Pounds	10	10	10¼	10¾	11¼
			QUANTITY.		
Ounces	33¼	33¼	40	40	40
Calories:					
Per pound:	36		51		

DATE:	Dec. 2.	Dec. 8.	Dec. 14.	Dec. 27.	Jan. 3.	Jan. 17.
Percentages:	F., 1.	1.18	1.28	1.40	1.75	2.
	P., 2.30	2.50	2.90	3.	3.25	3.25
	C., 8.25	8.25	8.25	8.	8.	8.
			WEIGHT.			
Pounds	12	12¾	12½	13½	14	15
			QUANTITY.			
Ounces	40	40	42	42	42	48
Calories:						
Per pound:		64				

Age at termination of treatment, nine and one-third months; duration of treatment, two and one-third months; gain, 5 pounds.

CASE IX. *History.*—R. G.; six months; present weight, 10 pounds; average for age, 16¼ pounds; never nursed; top milk mixtures; always regurgitated freely; stools good; now taking: fat, 2.25 per cent.; protein, 1.40 per cent.; sugar,7 per cent.; given skimmed milk, dextri-maltose and dextrinized flour gruel.

DATE:	Aug. 12.	Aug. 16.	Aug. 20.	Aug. 26.	Sept. 1.	Sept. 8.	Sept. 15.	Sept. 26.
Percentages:	F., 1.	1.	1.	1.10	1.25	1.50	1.75	1.75
	P., 1.50	1.75	2.	2.25	2.50	2.75	3.	3.
	C., 7.	7.	7.30	7.30	7.30	7.30	7.30	7.30
				WEIGHT.				
Pounds	10	10 4-16	10½	10 14-16	11½	12	12½	13
				QUANTITY.				
Ounces	42	42	42	48	48	50	50	50

Age at completion of treatment, seven and three-quarter months; duration of treatment, six weeks; gain, 3 pounds.

CASE X. *History.*—Baby S.; never nursed; weight, 11 pounds; fed upon various top-milk mixtures; stools usually hard, dry and light, now acid and fermented; no regurgitation; is taking: fat, 4.85 per cent.; protein, 1.77 per cent.; sugar, 6 per cent.

DATE:		July 2.	July 10.	July 17.	July 24.	July 31.	Aug. 14.	Aug. 28.
Percentages:	F.,	1.	1.	1.	1.25	1.50	1.75	2.
	P.,	1.75	2.	2.	2.50	2.75	3.	3.25
	C.,	5.	6.	7.50	7.50	7.50	7.50	7.50
WEIGHT.								
Pounds		11	11¼	11½	12	12½	13	13½
QUANTITY.								
Ounces		42	42	48	48	48	48	48
Calories:								
Per pound:								66

Age at termination of treatment, eight months; duration of treatment, two months; gain, 2½ pounds.

CASE XI. *History.*—Baby T.; six months; birth weight, 6¾ pounds; present weight, 11 pounds; average for age, 16¼ pounds; never nursed; fed upon various proprietary foods; now taking condensed milk 1-8; very constipated; hard, brown movements; restless and sleepless; given skimmed milk, dextrimaltose and flour gruel, dextrinized.

DATE:		July 14.	July 21.	July 28.	Aug. 10.	Aug. 30	Sept. 20.	Oct. 10.
Percentages:	F.,	.50	.50	.60	1.	1.50	1.75	2.00
	P.,	1.25	1.45	2.00	2.50	3.00	3.25	3.25
	C.,	8.	8.	8.	8.	7.	8.	8.
Calories:								
Per pound:								64
WEIGHT.								
Pounds		11	11½	12	12 10-16	13 10-16	14¾	16

Age at termination of treatment, nine months; duration of treatment, three months; gain, 5 pounds.

It is not claimed that high protein or low fat values succeed with all babies of this class. Although most of the cases here reported had a successful issue, we have had many failures; but infants of the mal-nourished type seem, in most cases, to thrive better if given low amounts of fat and comparatively high protein. An attempt should always be made to fit the food to the baby; to educate it to tolerate a rational dietary.

127 South Illinois Avenue, Atlantic City, N. J.

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held May 14, 1914.

DR. WILLIAM P. NORTHRUP, CHAIRMAN

PYLORIC SPASM.

DR. MARK S. REUBEN presented this patient, the youngest of 3 children. The first child died of inanition at the age of three months, having presented the same symptoms as the patient, except that they were more severe and persisted until death. The child probably had a hypertrophic stenosis of the pylorus. The second child was five years of age and had always been well. The patient came under observation at the age of eleven weeks. When six weeks of age he began to vomit, the vomiting being projectile in character and taking place from five to ten minutes after nursing. There was steady loss in weight and obstinate constipation. A pyloric tumor could be felt and the peristaltic waves were perceptible. The diagnosis of pyloric obstruction was made. After three or four attempts Dr. Hess succeeded in passing the duodenal tube, thus ruling out pyloric stenosis, and making the diagnosis of pyloric spasm possible. There were 4 to 5 ounces retention three hours after nursing. The infant was kept on the breast alone for four weeks, the intervals between feedings being three hours. The child continued to lose weight and all the symptoms persisted. The combined acidity at this time was from 115 to 85 degrees, and there was no free hydrochloric acid. By weighing the infant before and after feeding it was found that he was getting from 4 to 5 ounces at a feeding and examination of the mother's milk showed it to be of good quality. Complementary feeding was instituted after four weeks. Two grains of sodium citrate were added to every ounce of milk. Immediately the child began to gain in weight and all the symptoms subsided. A pyloric tumor could no longer be felt and the peristaltic waves were no longer visible. The retention in the stomach gradually diminished. The combined acidity continued to be from 100 to 85 degrees, and a trace of free hydrochloric acid was present. The points of interest in this case were: (1) There were 2 cases of pyloric obstruction in one family, both males; in one case the obstruction was of high grade and led to a fatal termination, while in the other it was mild and led to speedy recovery. These cases lent proof to the statement of Dr. Holt, who was of the opinion that in all these cases there was a real stenosis varying in degree in different cases. (2) The almost immediate improvement when complementary feeding was instituted. (3) The disappearance of pyloric tumor when the child began to gain. (4) The persistence of the high acidity, even when the infant was doing well, proving that the spasm was not due to high acidity. (5) An X-ray of the stomach taken since the child was doing well still showed much delayed transmission of food. Therefore too much reliance should not be placed on the X-ray findings in these cases, but rather more on the clinical phase.

CONGENITAL HYPERTROPHY OF THE LEFT HALF OF THE FACE IN A BOY SEVEN AND ONE-HALF YEARS OF AGE.

Dr. Sara Welt-Kakels presented this patient, whose family history showed no consanguinity, no lues, and no tuberculosis. A sister, two and one-half years of age, was perfectly healthy. The patient was born at the end of a normal pregnancy. The deformity was noticed at birth. There was nothing abnormal in dentition or in the time of walking or talking. The patient has had whooping-cough and measles, and occasionally sore throat, but otherwise has enjoyed good health. The facial hemihypertrophy had retained its proportions in relation to the right half of the face. At present the enlargement of the left half of the face was mainly in the lower two-thirds, not only the soft parts, but the bones as well, were involved. The enlargement of the cheek was most prominent; the upper and lower lips were much hypertrophied; the left angle of the mouth was drawn downward; the left nasolabial fold was effaced. The left half of the nose was large, but there was no hypertrichosis or coarseness of the hair. In the malar region there was a small telangiectasia about a quarter of an inch in diameter surrounded by a small pigmented area. The action of the facial muscles was somewhat interfered with by the hypertrophy, but the boy could frown, laugh and whistle. There was a slight diminution in the response to the faradic current. There was no disturbance of the sensibility of the special senses. There was sometimes salivation, seemingly from the left side. The mouth was mostly kept open, the left half projecting and the upper lip forming an ectropon. The appearance of the tongue was very conspicuous. It had been said that this organ participated only in the congenital, and not in the acquired form of facial hemihypertrophy. The point of the protruded tongue deviated to the right. The left half of the tongue was four to five times the size of the right. The left half of the hard and soft palate, the left tonsil and submaxillary gland were involved. On the inner surface of the left cheek were a few small tumors about the size of a pea. Like the cheek they gave the impression of lipomatous growth. The left upper jaw was much enlarged and thickened, especially in the alveolar portions, and the teeth were irregularly inserted. The left half of the lower jaw was also involved, but to a slighter degree. The boy was otherwise fairly well developed and showed no other abnormalities. He had a good intellect.

Dr. Henry M. Stark said that in view of the fact that the lipomatous tissue of the cheek and upper and lower lips were the seat of the maximum "giant" growth, it had seemed to him that the enormous hypertrophy was not without surgical possibilities, even though it was quite possible that subsequently, and after a long while, the initial results might have to be revised. That was, that even though some of the excess tissue should now be removed, as it was proposed soon to do, there might be in time a regrowth of this tissue, again calling for its plastic removal. It was proposed to remove in several sittings enough of the excess tissue to give for the present, and it was to be hoped for a long time, a good cosmetic effect. As Dr. Welt-Kakels had said, all the histologic elements in the region were involved in the giant growth. Should the bony structure at any time take on extraordinary growth any attempt at plastic correction would then be out of the question.

THE ROENTGEN RAY AS A DIAGNOSTIC HELP TO THE PEDIATRIST.

Dr. L. E. La Fétra presented this paper. (See p. 000.)

AN APPLICATION OF THE ROENTGEN RAY TO INFANT FEEDING.

Dr. Charles Hendee Smith presented this communication. He pointed out that the teaching of doctors and nurses for many years had been that the child must be kept at the breast or bottle for twenty minutes, must then be held in a perfectly horizontal position and be put to sleep at once without change of position. Many mothers did not follow this plan, but allowed the child to take a longer or shorter time for nursing and then held him up against the shoulder after feeding, or prone across the knees, or trotted him up and down in a sitting posture, finally, after an interval, putting him to sleep. One of these plans must be more desirable than the other. The posture of the child after feeding was of importance because of its relation to vomiting, colic, sleep, and general health. Radiography had shown the fallacy of the old idea that the stomach was vertical in infancy. The cardiac orifice was held firmly to the posterior abdominal wall. The fundus lay in the left paravertebral groove, on the diaphragm, spleen, tail of the pancreas, kidney and mesocolon, reaching a plane considerably posterior to the cardia; since the vertebrae projected forward some distance into the abdominal cavity, the pyloric end of the stomach was also pushed forward by the vertebrae, the head of the pancreas and the duodenum, and lay in contact with the anterior abdominal wall and liver anteriorly. The pyloric opening was directed backward to the duodenum, but lay in a somewhat more anterior plane than the cardia. There was therefore an obliquity of the long axis of the stomach from behind forward and to the right as well as from above downward and to the right. The cardiac opening was nearer the most posterior plane of the stomach than it was to the most anterior. The second factor in regard to posture was that there was a certain amount of gas in the stomach of every individual. Practically every radiograph taken in the erect position showed a bubble of gas in the fundus end of the stomach. In the prone position it was not possible to estimate the amount of gas present. The gas in the stomach might be derived from swallowed air, gastric fermentation, and intestinal gas. Swallowed air accounted for the gas in the stomach in the majority of cases. If the child was held in the horizontal position the liquid gravitated to the posterior part of the stomach, and that was the fundus, and forced the gas to the anterior part and to the right end of the body of the stomach and pyloric antrum. Hence it followed that the cardiac orifice, situated well back against the vertebral column, would be covered by the liquid and the gas could not escape into the esophagus. It could only escape through the pylorus if at all.

If the amount of food plus gas was enough to distend the stomach either food or gas must be forced out through the pylorus, or food must be regurgitated through the esophagus until the tension on the stomach wall was relieved. When the child was held upright the liquid gravitated at once to the most dependent part of the stomach, displacing the gas to the highest point, making it possible for it to escape through the esophagus. Dr. Smith exhibited X-ray plates illustrating these points and drew the following conclusions: 1. Regurgitation, colic and indigestion depend not only on the food but on the manner in which it is given and the posture of the child between feedings. 2. The food must be of proper composition and proper amount. It should be given at as long intervals as possible, depending on the gastric capacity and the total amount of food required per day. 3. A feeding should not be taken too slowly, five to ten minutes being long enough and fifteen minutes being the maximum time. 4. The child should be held upright before feeding to get rid of any gas in the stomach. If air was swallowed in large quantities it was often necessary to interrupt the feeding one or more times, holding the child erect until the air had been expelled. Immediately after feeding the child should be held upright against the mother's shoulder and given the opportunity to eructate gas. 4. The child should be placed in bed preferably in the prone position with the head of the bed somewhat elevated. This routine might be followed with every child, even though he did not regurgitate. Habitual tongue suckers have to be held up sometimes between feedings.

THE ROENTGEN RAY AND PNEUMONIA.

Dr. Howard H. Mason made this presentation, a lantern-slide exhibit showing what the X-ray revealed in pneumonia. A series of slides demonstrated the correlation between the beginning of the physical signs of pneumonia with the appearance of the shadow showing the beginning of consolidation. Other plates showed that with the disappearance of the physical signs of pneumonia the shadow of consolidation cleared up. The X-ray has shown that when a lung cleared it seems to clear equally all over and not from within outward or from without inward. Quite a change in the shadow was frequently noted within twenty-four hours. In all the early cases before the lung consolidated there was just dullness, but when consolidation extended to the larger bronchi one got all the signs of pneumonia, bronchial breathing, râles, etc. Still other slides showed the differences between the shadow of bronchial pneumonia and that of lobar pneumonia.

DR. WILLIAM P. NORTHRUP asked Dr. Mason whether in the old-fashioned so-called central pneumonia it was an undiscovered marginal lobar pneumonia that one had.

DR. HOWARD H. MASON replied that it was like the case shown, usually in the region of the scapula and difficult to make out. There were breath sounds, a few râles and dullness, but no bronchial breathing.

DR. WILLIAM P. NORTHRUP said he was reminded of a case in his practice in which the child had a high temperature, and slight stupor, in fact all the rational signs, but no local physical signs of pneumonia. The patient recovered by crisis and went on living. Competent men had seen the case in consultation with him and they all felt chagrined that they could find no local signs of the disease.

DR. WARD BRYANT HOAG asked why there was so much consolidation shown in lobar pneumonia, while in typical pneumonia with high temperature, rapid respiration and bronchial breathing the X-ray did not show such a marked shadow. In one case that came under his observation in which there were no physical signs on the sixth day, Dr. Kerley was called in consultation and he could make out no local physical signs. On the seventh day they did not take the sounds, but on the eighth day the child began to show physical signs and the first attempt to take the sounds with the stethoscope revealed the lesion and on that same night the child's temperature fell from 106° to 96° F.

DR. I. S. HIRSCH said that in regard to the difference between bronchial and lobar pneumonia he did not agree entirely with Dr. Mason. It was the general consensus of opinion that the pulmonary markings were due in lobar pneumonia to the blood vessels passing from the hilum to the periphery; the veins, arteries and capillaries all took part, and the density was due to the congestion of the blood vessels. The bronchi in the X-ray picture seldom showed except at the hilum and then but slightly in contrast to the thick shadow at the base. In pneumonia there were small spots showing the infiltration in the air vesicles. In all bronchial pneumonia there was a tendency to confluence and these small spots tended to coalesce. In lobar pneumonia there was an even density during hepatization and this served to differentiate the two forms of pneumonia.

Dr. William P. Northrup said it was most illuminating to see what had been unearthed by the X-ray. In the Presbyterian Hospital Dr. Mason had had a case of tuberculous meningitis in which the lungs showed no signs whatever of tuberculosis and yet the X-ray showed the lungs studded with miliary tubercles. The X-ray had certainly brought to them a new and valuable aid in dealing with children's diseases. In this case just referred to, at autopsy all the areas that the X-ray had indicated as affected were found to be involved.

ROENTGEN ILLUSTRATIONS OF BIRTH FRACTURES AND ATRESIA OF THE ESOPHAGUS.

Dr. Edward D. Truesdell exhibited two Roentgenograms showing atresia of the esophagus. The baby from whom the first picture was taken was a full-term child, who when he attempted to nurse suffered from peculiar attacks of choking and cyanosis. Careful examination did not throw any light on the case until an attempt was made to pass a catheter into the stomach. This could not be done and the X-ray showed the catheter in the blind pouch which ended at the bifurcation of the trachea and the cricoid cartilage. In the second case the condition was exactly similar. A number of slides were presented showing pressure deformities and fractures of the skull. They had never met with a fissure fracture, all that they had seen having been depressions similar to those of a ping pong ball. Illustrations of microcephalus with irregularities of ossification were also shown. Dr. Truesdell said he had seen ten birth fractures of the clavicle, but that they showed no particular feature; several of them were bilateral and in all union took place. They usually put these up in a figure of eight or a velpeau bandage. Of particular interest, as showing what nature could do in the way of repairing fractures unassisted, was a series of plates showing an angular deformity of the humerus resulting from a fracture without displacement. At the end of two weeks there was firm union, but a marked angular deformity. Successive plates showed the angulation becoming less and less, and at the age of two years the humerus was practically normal. The same thing had been shown to occur in other instances. Roentgenograms were also shown of fracture in cases of Erb's paralysis, fracture of the femur, and syphilitic periostitis.

THYMUS OBSTRUCTION.

DR. FREDERICK M. LAW said that the first plate exhibited was taken fifteen minutes after death and the findings had been confirmed at autopsy. The child had been operated on for cleft palate, the operation lasting one-half hour. Six hours after the operation the child appeared to be all right. The nurse observed him at this time; then turned to care for a child in the adjoining bed. A few minutes later she looked at the child and he was dead—having died without a struggle. The plate showed the enlarged thymus of the cap variety holding down over the heart. This was a case of status lymphaticus. A second plate showed an enlarged thymus of somewhat different shape.

TYPES OF INFANT STOMACH.

DR. LEON THEODORE LEWALD gave this lantern-slide exhibit. He first showed an illustration of an intussusception in an infant. The exact location was not apparent from the physical examination, as the tumor could not be made out; but by means of the X-ray the tumor was located so accurately that the incision could be made directly over it. At operation the intussusception was found to be exactly where the X-ray had indicated.

A series of Roentgenograms showed the variations in size, shape, emptying time, and the amount of gas in different stomachs of infants. The supreme test of the stomach function in infants as in adults was the emptying time. Even peculiar shaped stomachs were able to empty themselves in a reasonable time. The X-ray was sometimes a positive help in making the differential diagnosis between pylorospasm and pyloric stenosis, and in deciding whether an operation was necessary or not. The Roentgenogram from one case showed a small amount of food passing the pylorus; this case went without operation and got well. On the other hand, in another instance it was found that nothing had passed the pylorus in twenty-five minutes, and even at the end of an hour nothing had passed, and it was decided that operation was necessary. Two illustrations of congenital syphilitic stomach were shown. Both children gave a marked Wassermann reaction. In one of these cases there was a cicatricial area in the lower half of the stomach and an enteroanastomosis was done. The child did well for about a week when she began to vomit and another X-ray examination gave the clue to the trouble. The esophagus was found to be very much dilated on account of the small cardiac pouch and by feeding small quantities of food the child finally recovered. Roentgenograms taken two years or more after operation for congenital pyloric stenosis showed the food passing through the gastroenterostomy opening. If one could decide on the proper cases, one need not hesitate to operate, since the results had been shown to be very satisfactory.

RACHITIS TREATED WITH COD-LIVER OIL, CALCIUM AND PHOSPHORUS.—Schloss (*Deutsch. med. Woch.*, July 31, 1913) sums up this subject as follows: In three naturally nourished rachitic children it was found that the action of phosphorus and cod-liver oil had an unfavorable action on the calcium and phosphorus metabolism. The author's observations are not sufficient in number to prove his own thesis. Schabad has shown that lime exerts a favorable influence, especially when given with cod-liver oil, upon the calcium metabolism and, to some degree, likewise upon the phosphorus metabolism. In order to obtain ideal results, phosphorized cod-liver oil must be combined with some organic phosphate of lime—an albuminous substance containing the salt. Albumin phosphorus seems especially desirable for bone defects. However, an inorganic salt, calcium phosphate, should develop a good activity in naturally nourished children. Whether this result could be obtained without cod-liver oil, however, is a question. Schloss believes that phosphorized cod-liver oil or cod-liver oil alone should be replaced by a combination of the oil with a lime-phosphorus preparation.—*Universal Medical Record.*

MISCELLANY

A PEDIATRIC CENTER IN TIME OF WAR.

BY A. LEVINSON, M.D.,
Chicago.

The outbreak of the European war affected the medical and scientific activities as well as the economic. The workers were called to the battlefield and those who remained had neither time nor inclination to devote themselves to scientific work. Besides, most scientific institutions were converted into hospitals for the wounded and those left in charge had to limit themselves to work having a direct bearing on diagnosis.

In Vienna, the great medical center of the world, medical activity proceeded to adapt itself to the contingencies brought about by the outbreak of the war. The Serological Institute discontinued its original work and concentrated its efforts upon tests that would be of assistance in the diagnosis and treatment of army diseases, such as typhoid, dysentery and the like. The Cancer Institute and Laboratory conducted by Professor Frankel discarded research experiments in its own line and put itself at the service of the government for diagnostic work in physiological chemistry. The University of Vienna closed its doors to students and converted its lecture halls into hospital wards.

The Children's Hospitals in Vienna, foremost among which is the University Children's Hospital, suffered in the same degree, if not more. The University Children's Hospital has in time of peace done a good deal of scientific work, and has helped to solve many scientific problems that confronted the medical world. Escherich, while engaged in the furtherance of pediatrics, discovered the colon bacilli and shed light on the subject of the bacteriology of the stool in general. Moser started his work on scarlet serum in the old University Children's Hospital. Schick, now Dozent at the Hospital, has made valuable contributions to the diagnosis and pathology of scarlet, has described his symptom in bronchial gland tuberculosis, and has recently given to the world his epoch-making toxin skin-reaction in diphtheria. Scores of others connected with the hospital have enriched the field of science with the results of their research. The assistant, Meyerhofer, for instance, has contributed a wealth of material to our knowledge of metabolism, Herbert Koch to our knowledge of the pathology and symptomatology of meningitis, Kossovitz and Von Groer to the subject of immunity in general and immunity of the newborn in particular, Hecht to the study of electrocardiography, Von Reus to diseases of the newborn, Januschke to experimental therapy. As for Pirquet, the director of the hospital, aside from his clinical work as a pediatrician, he has enriched the scientific world by his tuberculin skin-reaction test, and by his contribution to the subject of allergy.

To all of this work the war put a halt. To begin with, the force at the hospital was depleted at the very commencement of the war. Every day it was another who was summoned to the front to serve as fighter or physician. It was impossible to continue old work or begin new at a time of such stress and uncertainty. Before very long only four men remained of the original force, and of these four, two expected to be called away at a moment's notice, leaving Pirquet and Schick in charge of the entire institution. The number of nurses, too, began to decrease, for the Red Cross needed more workers daily. Those who remained had much to do. Every spare minute they spent in preparing gauze and bandages for the wounded.

In the national crisis the welfare of the children had to suffer. The buildings formerly utilized only for children's diseases were cut down to one, the other two being converted into infectious pavilions for the wounded. The hospital was forced to turn from its doors scores of mothers with sick children who needed hospital care, for there were neither rooms nor workers to accommodate the many new cases that sought admission. It was heart-breaking indeed to see mothers with sick children in their arms and a few hungry ones at home turned away for lack of space. The hospital authorities did all in their power to relieve the situation by putting as many beds as possible in rooms usually meant for half the number, but the pressing needs could not be met fast enough. The young had to suffer with the old.

We had been priding ourselves on this age as pre-eminently a children's age. Everything has been done to increase the welfare of the child. The fight against infections is being waged victoriously; agitations for pure milk and natural feeding are reaping success. The height has been reached in the efforts for health and sanitation. Roof stations and open-air tents are accomplishing great things for tuberculous children.

Now as a result of the struggle of the grown-ups we must neglect our babies and deny them their right to good health. If in Vienna, the most advanced medical center in the world, this has occurred, how much more may we expect the negligence of our babes to be felt in the smaller centers? Such is war!

A FATAL ILLNESS ASSOCIATED WITH ACUTE INTERSTITIAL PAROTITIS.—M. H. Gordon (*The Lancet,* August 2, 1913) presents a communication based upon the histological observation of an unusual lesion—parotitis—in a series of 4 cases under observation in the postmortem room at St. Bartholomew's Hospital during the past few months. All of the patients were children. All had died after a short illness in which the symptoms pointed to meningoencephalitis. Postmortem, meningeal congestion was found in all the cases, and in two of them there were flattening of the convolutions and other evidence of increased intracranial pressure. In all alike no pus was present in the meninges. There was no evidence of tubercle in the meninges, brain, or elsewhere. The cerebrospinal fluid was clear and contained an excess of lymphocytes, but no visible bacteria. Sections of the cerebral cortex and of the cord failed on microscopic examination to yield histological evidence sufficient to justify a diagnosis of poliomyelitis. As regards the rest of the body, the lymphatic glands, both in the neck and mesentery, were swollen. In 2 cases the lymphoid tissue in the small intestine was more prominent than usual, this change being most marked in Peyer's patches in one case and in the solitary follicles in the other. In 2 of the cases petechial hemorrhages were seen; in the first in the parietal pleura and visceral pericardium, and in the second on the under surface of the liver and beneath the capsule of the kidneys. In all the children both heart's blood and cerebrospinal fluid had failed to show growth on agar, and their illness would have remained a mystery had it not been for the following observation. Although the salivary glands were not obviously enlarged and had given rise to no symptoms, they were found in all the 4 children to show on histological examination foci of acute inflammation—chiefly interstitial in distribution. If their illness was not due to the action of the virus of poliomyelitis or to that of mumps, there is a possibility that it was brought about by a virus as yet unidentified.—*Medical Record.*

CURRENT LITERATURE

ABSTRACTS IN THIS NUMBER BY

DR. WILLIAM LYON. DR. HAROLD R. MIXSELL.
DR. C. D. MARTINETTI. DR. MARK S. REUBEN.
DR. S. W. THURBER.

DISEASES OF THE EAR, NOSE AND THROAT.

GOODALE, J. L.: STUDIES REGARDING ANAPHYLACTIC REACTIONS OCCURRING IN HORSE ASTHMA AND ALLIED CONDITIONS. (*Annals of Otology, Rhinology and Laryngology,* June, 1914, p. 274.)

The author draws attention to the difference between the living proteins of bacteria and protozoa and the stable proteins of egg white, serum, albumin, etc. Both are made up of an acid poisonous nucleus and a basic non-poisonous group. The former has the same effect upon animals whether living or dead, but the latter in one instance induces immunity and in the other specific susceptibility. If the living protein be split up in the animal before it has time to multiply sufficiently to make enough poison, the animal lives and has been immunized. If the stable protein be introduced into the animal it produces a specific ferment and causes death on reinjection if enough ferment has been manufactured.

About one-third of the individuals receiving diphtheria antitoxin develop "serum fever" in the course of six to twelve days. This demonstrated that reinjection is not necessary to develop protein sensitization. In the individuals who develop "serum fever" within a few hours, or even minutes, anaphylactic shock is to be feared.

The duration of sensitization is apparently unlimited; thus cases showing serum fever should never be reinjected. Even one-drop doses have been tried in order to establish an after-tolerance, but with fatal results.

Those individuals who show vasomotor disturbances in the neighborhood of horses are most likely to show serum reaction. To prove this statement, 27 persons were tried by either dropping one drop of diphtheria antitoxin upon the turbinates or rubbing it into a scratch on the lobe of an ear, and in a summary the following results were obtained: In 3 there was marked intranasal vasomotor reaction with profuse sneezing and watery discharge which occurred promptly in a few minutes; 4 were negative for the intranasal test and also to the skin test on the lobe of the ear; 6 cases of bronchial asthma and 5 hay-fever cases were negative for both tests. It is suggested that a skin test be made in all persons who have previously received any horse serum medication and that an inquiry should be made of all persons about to receive antitoxin for the first time as to their susceptibility to asthmatic symptoms in the neighborhood of horses.

S. W. THURBER.

LAYTON, T.B., F.R.C.S., ENG.: TONSILS AND ADENOIDS IN CHILDREN. A PLEA FOR FEWER OPERATIONS. (*The Lancet*, April 18, 1914, p. 1,106.)

The author states that while there is much discussion as to the relative merits of tonsillotomy and tonsillectomy we have not taken time to determine whether too many operations are performed. While we do not know the function of the tonsillar tissue, we have good reason to believe that it forms an early and important line of resistance to infection. The presence of hypertrophy is not alone sufficient ground for operation, as the proper care of the teeth, training in nasal breathing and the working out of a correct general hygiene will frequently obviate the necessity for operation. He feels that the dangers from anesthesia, infection, hemorrhage and traumatism are real and not to be ignored in determining upon operation, and that all cases operated should receive prolonged and thorough after care. When the throat condition is part of a general lymphatic hypertrophy little may be expected from the operation and it is wise to operate in no case where the temperature exceeds 99°F., as in this way one may usually avoid complications incident to beginning infectious diseases. He knows of no operation where so much good is so easily done in carefully selected cases and urges against indiscriminate operation as a means of needlessly bringing this procedure into disrepute.

WILLIAM LYON.

RICHARDSON, J. J.: A STUDY OF VINCENT'S ANGINA. (*Annals of Otology, Rhinology and Laryngology*, June, 1914, p. 335.)

In this complete presentation of this lesion in an article of thirty pages it is impossible to fully abstract, but the summary is well worth quotation.

The disease is the local manifestation in the mouth and throat of the lesions caused by the fusiform bacillus and spirillum bearing Vincent's name; these two organisms are probably different stages of the same one and they may occasion membranous, ulcerous or gangrenous lesions in other parts of the body. It frequently occurs as a secondary infection following the exanthemata and is rarely seen after the thirtieth year. As a primary infection it is best prevented by proper care of the mouth and general health. It is contagious on close contact; recurrences are not uncommon and it may become chronic. Its most common site is the faucial tonsil, and though it frequently causes marked general malaise it is not commonly associated with any fever. Proper diagnosis depends on examination of a smear. It is most often confused with tonsillitis, diphtheria and syphilis. Treatment is principally local and trichloracetic or chromic acids carefully applied have given the best results, though salvarsan has been given in stubborn cases with good results.

S. W. THURBER.

MEDICINE.

FLOYD, CLEAVELAND, M.D.: THE TUBERCULOUS CHILD. (*Boston Medical and Surgical Journal,* April 30, 1914.)

This is a short resumé of the more recent findings on tuberculosis. Formerly an early diagnosis of pulmonary tuberculosis was considered to be the chief aim of the clinicians. Then followed adequate provision for those suffering from the disease in its advanced form. Now the importance of the child as a factor in the problem has slowly become recognized. By eliminating the tuberculous cow, fully ten per cent. of tuberculosis in infants has been eliminated. The marked sensibility of the infant makes for generalized tuberculosis. At an older period general glandular infection is present, and only as the child moves on towards adolescence is the localized pulmonary infection predominant. By far the greater avenue of infection is by direct inhalation. Therefore the seat of the disease in the child may be the root of the lung and therefore not evident except as manifesting itself as a state of chronic ill health or general debility. If then we surround the child who has been exposed to tuberculosis in the susceptible years of life with healthful conditions in the home, healthful conditions of study, and if we prevent its early entrance into the confinement of factory or workshop life and do this on a sufficiently large scale the problem will be solved. HAROLD R. MIXSELL.

MARTINEZ, F., AND ALEJANDRE, F. C.: KALA-AZAR ON THE SOUTHERN COAST OF SPAIN. (*La Ped. Española,* September 15, 1913.)

The authors have collected data of 17 cases of kala-azar in Grenada, Malaga, and Almeria. These children, usually under two years of age, showed the parasite in blood extracted by splenic puncture. Clinically the symptoms were all present—fever, anemia and splenomegalia. Often noma was present, often bronchopneumonia and enteritis. C. D. MARTINETTI.

GREEN, ROBERT M., M.D.: INTRACRANIAL HEMORRHAGE IN THE NEWBORN. (*The Boston Medical and Surgical Journal,* April 30, 1914.)

A number of cases were cited by the author and the following conclusions were drawn:

(1) Intracranial hemorrhage may occur in the newborn, either from the trauma of operative or normal labor or in association with hemorrhagica neonatorum.

(2) It often does not present the typical clinical picture of increased intracranial pressure.

(3) Its presumptive diagnosis depends on early recognition of refusal to nurse, pallor and slight facial edema, which may be confirmed by the appearance of more classic signs.

(4) Diagnosis may be positively established, and some therapeutic relief afforded by lumbar puncture (when the hemorrhage is infratentorial), or by cranial puncture (when the hemorrhage is over the cerebral convexity).

(5) If these measures fail to give relief, operative decompression by craniotomy is indicated.

(6) The majority of intracranial hemorrhages in the newborn are subdural, but intraventricular hemorrhages may also occur.

(7) The source of bleeding may be from laceration of the tentorium, of the choroid plexus, of the longitudinal sinus, or of the pial vessels.

(8) In the cases associated with hemorrhagic disease preliminary transfusion may be indicated before craniotomy.

(9) The gravity of the prognosis demands an enlightened prophylaxis by avoiding all unnecessary occasion for fetal trauma.

HAROLD R. MIXSELL.

STAMM, CARL: A CASE OF MULTIPLE SCLEROSIS IN CHILDHOOD. (*Archiv. für Kinderhk.*, July, 1914.)

E. G., twelve years old, comes of a healthy family; two sisters died of marasmus; one brother of diphtheria; the mother aborted once. In October, 1912, the boy became blind in the right eye. Diagnosis was a central scotoma and retrobulbar neuritis; within six to eight weeks there was improvement in the vision, but the boy began to complain of weakness in arms and legs and that he had difficulty in walking; he observed that he was getting duller of comprehension and that his speech became slow and scanning. He had no convulsions and there was no vomiting and no fever. Physical examination revealed a fairly robust child of normal height. On standing and on voluntary motion the extremities quivered; the right more than the left; walking was spastic and ataxic; Romberg symptom positive; right arm slightly spastic; triceps reflex increased; hand-shake on right side perceptibly weaker; no tremor; no ataxia of hands. Patellar and Achilles reflexes increased on both sides. Patellar clonus, foot clonus, positive on both sides. Babinski, Oppenheim and Trömner's phenomena also positive on both sides. Sensibility intact; speech slow and scanning. von Pirquet and Wassermann reactions negative. Eye examination: Emmetropia both sides S = 1.0; bilateral nystagmus (rotary); slight amsocoria; pupils rigid; slight pallor of both papillæ.

The treatment consisted of rest in bed and intramuscular injection of fibrolysin, according to the methods of Nonne. The boy had eight injections in all; twenty-nine in five to six days' pauses. After the third injection there was slight improvement; the tremor, the patellar and the foot clonus disappeared. The boy is now (eight months after initial treatment) entirely free of all symptoms; speech and walking are normal; he has improved in his studies; there is still a slight rigidity of the pupils. Whether the child is in a state of remission or cured as a result of therapy only the future will reveal.

MARK S. REUBEN.

BOOK REVIEWS

HARVARD HEALTH TALKS. THE CARE AND FEEDING OF CHILDREN. By JOHN LOVETT MORSE, M.D. Cambridge: Harvard University Press, 1914.

This little book with the imprint of a great university and the authorship of an eminent pediatrist behind it should be, as it is, excellent indeed. It is the substance of public lectures delivered at Harvard University, and its aim is to give modern ideas of the care of children to parents and nurses. It is a smaller book than many of the kind which have been issued in so great abundance, but it is none the less valuable for that, because it is crammed full of concentrated information. Moreover, it avoids the fault of prolixity and the danger of telling lay persons so much that they either become so confused that they cannot tell what to do, or, thinking they have drained the Pierian Spring, they venture to do too much for their children and bring on disaster.

DISEASES OF INFANCY AND CHILDHOOD: THEIR DIETETIC, HYGIENIC AND MEDICAL TREATMENT. A TEXT-BOOK DESIGNED FOR PRACTITIONERS AND STUDENTS IN MEDICINE. By LOUIS FISCHER, M.D., Attending Physician to the Willard Parker and Riverside Hospitals of New York City; Attending Pediatrist to the Sydenham Hospital; Former Instructor in Diseases of Children at the New York Post-Graduate Medical School and Hospital, etc., etc.; Fellow of the New York Academy of Medicine. Fifth edition. With 301 illustrations, several in colors, and 43 full-page half-tone and color plates. Philadelphia: F. A. Davis Company, Publishers. English Depot: Stanley Phillips, London, 1914.

This book includes 935 pages, is handsomely gotten together, and is intended as a text-book for reference. The last edition preceding this one was in 1911 and the unusual advances in pediatrics have made it necessary to rewrite the book. In the section on nutrition, Dr. Fischer talks at length on the administration of high protein. High fat, as given in cream formulæ, has practically been abandoned by the author. Sugar is regarded as a disturbing factor in metabolism, although formerly it was classed as a neutral element. Finkelstein's classification of gastric and intestinal derangement is used and includes new and important chapters. Milk idiosyncrasies have been investigated and articles on anaphylaxis, amebiasis, uncinariasis, acetonemia and spasmophilia have been added. New plates—many of them colored—have been added to the sections on infectious diseases, while less important illustrations have been dropped. The illustrations covering intubation are most instructive and have been enlarged, with cross section illustrations added. Vaccine and serum therapy with clinical cases are given. The luetin test for syphilis is a new section. As a reference book the book fulfils its mission.

INFANT FEEDING. By CLIFFORD G. GRULEE, A.M., M.D., Assistant Professor of Pediatrics at Rush Medical College (in affiliation with the University of Chicago), Chicago, Ill.; Chief of Pediatric Staff, Cook County Hospital; Attending Pediatrician to the Cook County, Provident, and St. Bernard's Hospitals; and to Home for Destitute Crippled Children, Chicago; Associate Pediatrician to the Presbyterian Hospital, Chicago. Illustrated. Second edition. Thoroughly revised. Philadelphia and London: W. B. Saunders Company, 1914.

This edition contains 314 pages, has been thoroughly revised and added to. The book is based on a course of lectures given to the students at Rush Medical College for the past three years and is written in a very clear, entertaining manner. Although much of his material has been freely borrowed from the German writers, the author has amplified it by his own personal experience. Twenty-nine photographs and drawings are inserted to emphasize important points. The contents include:—

(1) Fundamental principles of infant's nutrition.
(2) Nourishment of the infant on the breast.
(3) Artificial feeding.
(4) Nutrition in other conditions.

Under artificial feeding Finkelstein's classification is adhered to, with the exception that weight disturbance is more definitely defined, while decomposition covers a somewhat broader field. The author has succeeded in his endeavor to emphasize practical points and principles in such a way that the general practitioner can grasp them, and for this reason the book is a valuable one.

ARCHIVES OF PEDIATRICS

NOVEMBER, 1914

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EDITORIAL

A RECOGNITION OF PIONEER EFFORT.

There was observed, recently, in one of the streets of New York's great "East Side" the legend on a sign hung in a grocery window *"Grade B Milk, 6 cents a quart."*

This means that, even in these days of high cost of living, the poor of one great city, at least, can obtain over 600 calories of a readily assimilable, well balanced food for 6 cents, or about 1 cent per 100 calories. This at a time when the poorest cuts of beef are selling at prices which mean a cost of 2 cents per hundred calories for a food not so well balanced nor nearly so universally adaptable. Moreover, this cheap, available food presented here as Grade B, is in a form which, though not recommended for infant feeding, may yet be used without disaster. Officially it may contain not more than 100,000 bacteria per c.c.

when it is used, and at some time during the thirty-six hours that may legally intervene between the cow and the consumer, this milk has been pasteurized and the pathogenic organisms killed.

Compared to the unbottled milk peddled not so many years since for 6 cents a quart, in a dirty shop, where the rear end served as kitchen and bedroom for a number of persons, dipped with a doubtful dipper from a warm, fly-girt can, milk well compared in its bacteriological aspect to the turbid slime that is to be seen at low tide dripping from the ends of sewers—compared with that milk, this proclaimed by the neat sign *"Grade B Milk, 6 cents a quart"* is perfection nearly realized. We need not go back to the days of cows stabled in darkness and fed on distillery slops for a sufficiently striking contrast.

Why is it possible that now a respectable bottled milk can be obtained where, and for what price, a most disreputable "loose" milk was once obtained? Why is it, that in the metropolis at least, the prevailing epidemic of foot and mouth disease has caused but the merest flutter of apprehension among those sensitive barometers of all that affects the health of children—the mothers of young infants? Why have they felt safe in using the milk supplied them in New York?

First, and most immediately, because New York has the fortune to have had a Health Department wise enough to formulate, and powerful enough to enforce, regulations which will ensure that no milk from tuberculous cattle and no milk having more than 10,000 bacteria to the c.c.* shall be sold raw in the greater city of New York; that all other milk shall be pasteurized and that no milk containing more than 2,000,000 bacteria to the c.c., even in the hottest part of the summer, shall be pasteurized to be used for drinking purposes. Second, because the pasteurization which the Department requires for all but the highest grades of milk has been devised, advocated and perfected as a commercial process. We owe much to the ardent protagonism of a certain few whose logical minds saw the value of pasteurization and its future, and who, by day in and day out preaching, overcame medical prejudice and awakened public interest in this means of protection, so that when it became a requirement of the authorities there was slight or no opposition.

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* On November 13th, the Board of Health cancelled all permits to sell "Grade A Raw" milk.

But that is not all. No one would have thought of pasteurizing milk, as perhaps we would not have arrived at scientific milk modification without the chemical analysis of mother's milk as a point of departure, unless there had been a standard by which milks needing pasteurization could be judged and proved wanting.

We must go back of our regulations and of our pasteurization enthusiasms to the time of the beginning of the effort toward "clean milk"; back to the first Medical Milk Commission; back to the production of the first certified milk, if we would understand aright where to place the honor we would give for the condition of things to-day. Had these pioneers not preached the gospel of clean milk, laid down standards of purity, and devised dairying methods which took the asepsis of the operating room out to the farm, we might not yet know what dirty stuff carelessly produced milk may be, nor achieved that ideal of the pure milk producer—a milk which scores "no growth" many times a month. Upon their work, therefore, rests our present-day satisfactory condition. Let us recognize our indebtedness!

Further, there is as much need now as ever to insist on clean milk, whether we believe milk is best fed raw or fed pasteurized or boiled. The more generally milk is produced under certified standards, the better it will be, raw or pasteurized.

ORIGINAL COMMUNICATIONS

THREE CASES OF GONOCOCCUS SEPTICEMIA WITH ARTHRITIS FOLLOWING SCARLET FEVER.*

BY MATTHIAS NICOLL, JR., M.D.,
New York.

The following 3 cases of generalized gonococcus infection with arthritis seem worthy of record, not on account of the rarity of the condition, but as demonstrating the necessity for routine blood cultures in cases of so-called scarlatinal arthritis. The patients were admitted to the scarlet fever hospital of the Department of Health in the service of Dr. Alfred Hess and that of the writer.

CASE I. Mollie S., aged twenty-one months, admitted April 24, 1914. The physical examination was negative except for the presence of desquamation and a congested pharynx. As there was some vaginal discharge, she was sent to the ward for "observation" vaginitis cases, although an examination of a number of smears of the vaginal discharge, made at various times during her stay in the hospital, failed to show the presence of Gram-negative cocci.

The temperature during the first ten days did not rise above 100°.

On May 6th there was a sudden rise of temperature to 107°, and, as the appearance of the throat suggested diphtheria, 10,000 units of antitoxin were given, following which the temperature fell rapidly to normal, but rose again almost to as high a point two days later.

May 11th, a blood culture showed the presence of gonococci. There was a septic rash on the body, an otitis media on the right side, and an arthritis of the right wrist. The lungs, heart, abdomen and throat were negative.

May 13th, arthritis of left wrist. Ulcerations about the mouth with profuse oral discharge. Fifty million polyvalent gonococcus vaccine were given.

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* From the Research Laboratory, Department of Health, New York

May 14th, 100 c.c. of polyvalent gonococcus serum given subcutaneously. Neither this nor the vaccines had more than a temporary beneficial effect on the temperature and pulse, which showed great daily excursions.

May 18th, 50 c.c. of gonococcus serum given.

May 22d, there was a systolic murmur heard most intensely over the pulmonic area. The swelling of the right wrist was less marked.

June 13th, blood culture negative for gonococci.

The administration of vaccines was continued on every third or fourth day, the dose being increased by 50,000,000 at each injection until a maximum of 600,000,000 was reached, on July 7th. Following the earlier injections there was usually a temporary rise of temperature, but in the last three weeks they produced no apparent effect on the temperature, which, except for a few slight exacerbations, did not rise much above 100° up to the time of the patient's discharge, on July 12th. On leaving the hospital the involved joints showed a moderate amount of thickening with some limitation of function, but no visible enlargement. The patient had lost a good deal of weight and was very anemic.

August 4th, a visit paid to the patient's home showed an improvement in her general condition. The right wrist was slightly tender, the left wrist weak. There was no ankylosis in either. There was a soft, blowing systolic murmur at the apex of the heart, transmitted to the left and heard at the lower angle of the scapula. The pulmonic second sound was accentuated. The heart was somewhat enlarged.

In an attempt to determine the portal of entry of the blood infection, in addition to the several vaginal smears, material from the tonsils and ulcerations about the mouth were also examined for Gram-negative cocci, with negative results.

CASE II. Lazar N., aged five years, was admitted to the hospital April 28th, ill one day with an attack of scarlet fever of moderate severity. The temperature on admission was 102.5°, pulse 140, both falling to normal on the fourth day. On physical examination there was noted a faint systolic murmur at the apex of the heart.

May 4th, there was a rise of temperature to 104°, the cause of which could not be ascertained.

May 12th, there was a papulo-erythematous eruption on the legs and arms, which on the following day became pustular in a few of the lesions. The right wrist was very tender, the temperature rising to nearly 107°.

May 14th, a blood culture showed the presence of gonococci.

May 15th, the eruption had spread slightly over the chest and abdomen.

May 16th, 50,000,000 polyvalent gonococcus vaccines given, the temperature at the time being 105°.

May 19th, the temperature and pulse had fallen almost to normal; the right and left wrists were swollen and tender. The systolic murmur at the apex was transmitted to the axilla.

June 1st, wrist joints much improved; left elbow involved.

June 2nd, blood cultures negative for gonococci.

June 3d, all joints much improved.

June 19th patient was discharged in fairly good condition.

A visit made to the patient's home, on August 5th, showed that the general condition had improved since leaving the hospital. All the joints were normal. There was a systolic murmur heard at the base of the heart, probably of hemic origin.

It may be remarked that there had never been at any time any evidence of urethritis in this patient; nevertheless it is unfortunate that urethral smears were not examined for gonococci. The writer has reported a case of general gonococcus infection in a male child in which gonococci were found to be present in the urethra, although there had been absolutely no evidence of urethritis.

CASE III. Celia S., aged six and one-half years, admitted to the hospital on June 8th, ill four days with scarlet fever of rather a severe type. Physical examination showed a heavy scarlatiniform rash over the entire body. The throat was markedly congested, with exudate on the tonsils. There were moist râles over the lung bases, posteriorly. Temperature 105°, pulse, 170. The vaginal smears were suspicious of gonococcus infection, and on June 26th gonococci were found.

June 12th, blood culture showed the presence of gonococci.

June 13th, the patient's condition had been grave up to this date, when the temperature and pulse fell to normal. A slough in the pharynx had involved the deep tissues and caused perforation of the anterior pillars of the fauces.

June 14th, there was a general maculo-papular eruption over the body; the ankle joints were swollen and tender. The temperature rose to 103½°.

July 3d, a blood culture was negative for gonococci. The patient made a gradual recovery under purely symptomatic treatment, no serum or vaccines being used, and was discharged on July 28th in good condition.

The occurrence of so-called scarlatinal arthritis is a fairly common complication of scarlet fever in hospital practice, its frequency varying in different epidemics. The causative factor, notwithstanding numerous theories in regard to it, remains as little known as that of scarlatinal nephritis, although the occurrence of both during the convalescent stage of the primary disease would suggest a common origin. Blood cultures taken from cases of scarlatinal arthritis of the ordinary type are usually negative, nor do the course of the temperature and general symptoms of most of the cases suggest the presence of general sepsis.

In the tendency toward chronicity, the production of more or less thickening and limitation of function in the involved joints, the disease resembles more closely gonococcus arthritis than ordinary acute articular rheumatism, and furthermore differs from the latter in that it frequently occurs in children under five years of age, while, on the other hand, the liability to endocardial involvement seems to be equally pronounced in both.

How many cases of scarlatinal rheumatism, occurring especially in hospital practice, are really due to gonococcus infection it is not possible to say, but there can be no doubt that a number of such cases escape recognition through neglect to take blood cultures.

The presence of the eruption not usually seen in cases of scarlatinal arthritis, suggesting the presence of some blood infection, was largely responsible for the taking of blood cultures in the 3 cases reported and thus led to a correct diagnosis.

The prognosis of gonococcus infection of the blood in childdren, while grave, would seem to be less so than in adults and the liability to destructive heart lesions less pronounced. The value of gonococcus vaccines in the more or less chronic complications of gonorrhea would lead one to expect benefit to follow their use in cases of arthritis. It cannot be said, however, that the course of the disease in the two cases in which they were here used differed radically from that of the one treated symptomatically.

The writer wishes to express his thanks to Dr. Hess for permission to publish an account of these cases.

REFERENCE.

Nicoll and Wilson: Journal of Infectious Diseases, January, 1912, Vol. XII., No. 1, pp. 52-54.

CASEIN-FAT MILK AS FOOD IN DISEASE AND HEALTH.—P. Heim and M. K. John (*Monats. f. Kinderhk.*, Bd. XI., Nr. 12, 1913) fed 45 healthy children, beginning between the end of the second week of life and the fourth week, with casein-fat milk and continuing to the end of the seventh month. The children were at the end of that time all in good condition; the color, sleep, appetite, absence of dyspeptic processes, activity, motility, and all the bodily functions remained normal. The skin and mucous membranes were normal, in contrast to the eczematous conditions frequently observed in children fed on cow's milk. The milk is prepared by heating to 40°C. with a coffeespoonful of labessence, causing a complete coagulation. The curd is then thoroughly broken up by stirring, when the cheese is pressed through a fine hair sieve, allowing the whey to run out. The remaining curd is mixed with two-thirds as much warm water and pressed through the sieve. An almost homogeneous fluid remains. This is placed on the fire to boil for three minutes. Then one-third hot cow's milk is added and 30 grams of Sohxlet sugar, and the mixture is put in a cool place. When this milk is given to young healthy children their nourishment is perfect, and when given to dyspeptic children the good effects are very soon apparent. The stools become fewer, consistency and color normal, body weight begins to increase and diuresis is apparent. The number of feedings can be reduced. Increase in weight, and in growth in length, ossification of the bones, and function of the bodily organs are all found to be normal under this feeding. If constipation is caused it can be combated by the use of milk sugar. The effect of this food on dyspepsia is seen in twenty-four hours. The food agrees with very young infants, in whom cow's milk causes dyspepsia.—*American Journal of Obstetrics.*

PYLORIC STENOSIS IN INFANCY.

BY MARK S. REUBEN, M.D.,
New York.

INTRODUCTION.

A critical review of the literature on this subject reveals more discrepancies and differences of opinion than that of any other subject which has come to the writer's notice. While on some phases of this subject there is an honest difference of opinion, on others the difference is partly due to wilful disregard of facts established by other investigators and mostly due to a blissful ignorance of the literature. The last word has yet to be spoken on this subject, and those who have had the largest experience with this group of cases have changed their views on the pathogenesis of this disease from time to time. The whole question of the pathogenesis of this topic is an open one and must be so until experimental proof is adduced to prove whether simple spasm of smooth muscle leads to hypertrophy or not. There are no experimental data at hand to prove or disprove this, yet most writers have taken this for granted as if it were a proven fact. Persistent belief by many, that simple spasm leads to hypertrophy, has with age become almost everywhere accepted. Physiology, however, lends no proof to this, and before we can classify these cases into any definite groups we must produce evidence based on experiments *in vivo,* and not on theoretical considerations. Knowledge of this simple fact is indispensable to a scientific understanding of the pathogenesis of this disease. The differences of opinion on this point are therefore based on ignorance of facts and are entirely founded on theory.

A few writers claim that every case which clinically shows symptoms of pyloric obstruction at autopsy shows a pyloric tumor; this is surely a misstatement of fact. Others claim that no case with a definite pyloric tumor ever recovered on medical treatment; this too is incorrect. Still others claim that bile is never present in the vomitus of hypertrophic stenosis; a fact which has been demonstrated in a number of cases. Some claim that all cases should be treated medically; others that all should be treated surgically, and there are many other discrepancies which will be brought out in the body of the paper. Suffice it to say that a critical review of the literature makes it possible to answer definitely most of the disputed and mooted questions. This paper is based on a study of fourteen personal cases and the literature of the subject.

HISTORICAL.

Many writers give Beardsley credit for reporting the first case of this disease. A review of his report (I believe) does not lend proof that his was a true case of hypertrophic stenosis of the pylorus, but rather one of simple stenosis. In language quaint and olden he reported, in 1788, an infant who in the first week of infancy was attacked with a "puking"; the feces were in small quantity and of ash color, which continued with little variation till its death. The boy died at the age of five years. Autopsy revealed an unusually large stomach; the pylorus was invested with a hard, compact substance or "schirrosity." As will be seen, the course of the disease and the autopsy findings are not those of a true case of hypertrophic stenosis, but rather those of simple stenosis of the type described by Landerer and Maier.*

Williamson should be given the credit for reporting the first case of this disease. In 1841 he reported "A Case of Scirrhus of the Stomach, Probably Congenital." The patient was a male, who began to vomit a few days after birth and was markedly constipated. The infant died at the age of five weeks. On autopsy " . . . the pyloric extremity of which (stomach) felt hard and indurated, forming a remarkable contrast to the soft and yielding parietes of the viscus when emptied of its contents. . . . The pyloric orifice was so contracted as scarcely to admit a small silver probe. The mucous coat was slightly thickened, whilst a scarcely distinct remnant of the middle or muscular tunic was observable. On the other hand, the submucous cellular tissue was so much hypertrophied and indurated as seemingly to be the only tissue contained between the mucous and peritoneal coats." He also says: "So far as I am aware, this is the only case of the kind ever detailed as occurring in a subject so young and I think we may fairly regard it in the light of a *congenital affection.*"

In 1842 Dawosky published a paper on "Hypertrophie des Submucösen Zellegewebes am Pylorus Eines Ten Wochen Alt Gewordenen Kindes." He was the first to call attention to the projectile nature of the vomiting in these cases, to the presence of starvation stools, and to the use of milk enemata as a therapeutic measure. Speaking of the vomiting, he says: " . . . das Erbrechen stürzte wie aus eines Fontaine hervor"; and of the stools he says: " . . . das Erbrechen und die mit demselben gleichzeitig eingetretenen sparsamen Darm entleerungen, die nur selten feces enthalten, grossentheils aber aus einen dunkelbraunen masse benstanden." When one reads his article he must be impressed with the fact that Dawosky must have been familiar with the article of Williamson, for in places he almost literally quotes him. Both of these writers have mistaken the submucous coat for the muscular.

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* Pauli's article on the subject we could not obtain to review.

In 1879 Landerer reported a series of cases in older people, the youngest of which were twelve and sixteen years old respectively. He was the first to name these cases "Congenital Pyloric Stenosis." In 1885 Maier more carefully worked out the pathology and treatment of these cases and was the first to call attention to the similarity of the pyloric tumor to the portio-vaginalis uteri; a simile which was much referred to by later writers.

For the modern conception of this disease we are indebted to Hirschsprung, who reported 2 cases with autopsies in 1887. He was the first to recognize that the hypertrophy was mostly of the muscular layers and not of the submucous coats.

In 1896 Finkelstein was the first to call attention to the presence of a palpable tumor in some of these cases. The first case to be operated on for this trouble was by Stern in 1897, and the second (first American case) was by Willy Meyer in 1898. Both cases died. The first successful gastroenterostomy performed on an infant for this malady was carried out by Löbker in 1898.

CLASSIFICATION.

Pyloric stenosis in infants may be either spasmodic or hypertrophic. Although the former type has been denied by many, it is a fact proved by autopsy that a few cases which presented all the symptoms of pyloric stenosis during life on autopsy showed a perfectly normal pylorus, thus proving that the symptoms must have been due to a spasm of the pylorus and not to an organic obstruction as is seen in hypertrophic stenosis. Such cases have been reported by Rotch, Schmidt, Mühlenhardt, Pfaundler, La Fétra and others.

What the primary condition in this disease is, is entirely problematical. Some believe that the spasm is primary and the hypertrophy is secondary. (Thomson-Heubner-Finkelstein.) Hirschsprung and others (more recently Holt) believe that in all these cases there is a hypertrophic stenosis of the pylorus, a position which is no longer tenable. Others believe that both these types are distinct, but that spasm may be superimposed upon hypertrophy (Pfaundler), a view which seems to be most rational and one which explains many of the phenomena observed clinically. Holt is of the opinion that the two elements—the spasmodic and the hypertrophic—are probably present in every case, sometimes one and sometimes the other predominating. He states: "It is my own view that the essential difference between the groups of cases is one of degree rather than a difference in kind, but the same elements are present in the two." Holt believes that spasm plays an important part in the production of symptoms, and he also believes that the disappearance of all symptoms which occurs in a certain proportion of instances in the course of a few weeks points in the same direction; but he says: "On the other hand, if spasm were, in a large proportion of the cases, the only factor, why should recovery be, as we find it, a matter of weeks, often of months?" While this statement cannot be denied, there are quite a number of cases recorded in which all the symptoms, tumor and visible peristalsis disappeared within twenty-four hours. There is only one possible explanation for this, and that is the assumption that spasm and spasm alone must have been the cause of all the symptoms in these cases. One such case will be cited in detail in connection with this paper. However, the suggestion of Holt to consider these cases as mild and severe regardless of the nature of the lesion is most helpful. An infant dead of spasmodic stenosis is just as dead as one of hypertrophic stenosis. The usual belief that spasm cases are never fatal has led to many unnecessary deaths which could have been saved if the degree of stenosis was thought of and not the type of obstruction.

Whichever element may be primary, there is no evidence to explain the cause of the spasm or the hypertrophy. The spasm has been variously explained as due to swallowing of amniotic fluid, hyperchlorhydria, as an evidence of spasmophilia, faulty innervation, lack of muscular coördination and to many other insufficient reasons. Hypertrophic stenosis has been observed in a seven-months fetus (Dent) and in the newborn (Ashby, Simonsohn, Delamaré); it is undoubtedly a congenital condition;

the symptoms, however, usually do not appear from seven to fourteen days after birth; this does not mean that the lesion is not present at birth. The lesion may not be of a severe enough degree to cause symptoms, but with the advent of nursing and with the superimposition of spasm the latent lesion becomes manifest and the obstruction more marked. The lesion cannot be explained embryologically nor as a reversion to a lower type of stomach. Thomson suggested that it may be a congenital malformation due to defective coördination in utero. He found similar hypertrophy in the bladder with dilatation of ureters and renal pelvis without any organic obstruction, and also in the colon with no organic stricture. He looks upon these hypertrophies as a sort of localized gigantism. In 4 per cent. of these cases are found malformations in other parts of the body, as dilated ureters, hydronephrosis, atresia ani, congenital heart, hypospadias, etc.

The writer is of the opinion that two distinct types of pyloric obstruction exist—the spasmodic and the hypertrophic; each may run a latent course if the stenosis produced is of a mild degree; that each type may present various degrees of obstruction and that spasm may become superimposed upon a case of hypertrophy and thus render a latent case of hypertrophic stenosis manifest, or make it more severe by producing a greater degree of stenosis. But whether hypertrophy results in any case of spasm, as the result of the persistent spasm, is an open question which cannot be answered at this time.

SYMPTOMS.

Frequency.—Pyloric stenosis in infants occurs more frequently than one would surmise from the number of cases reported in the literature. Up to 1904 there were only 123 cases reported in the literature; in 1908, 416, and in 1910 there were 598 cases recorded. Up to date there are over 1,000 cases reported. The largest individual collections were reported by Hutchinson (81 cases in 1910) and by Holt (57 cases in 1914).

Predisposing Causes.—Pyloric stenosis is far more frequent in males than in females, the ratio being 4 to 1. It usually affects the first born more frequently than later born children, and it may affect more than one member of the same family. In one instance both mother and infant were similarly affected. Quite a number of the recorded cases occurred in the physician's own family. Ibrahim has noted gastric disturbance in the mother during pregnancy in a number of his cases. The great majority of the affected infants were breast-fed. The birth weight of many of these patients has been rather above normal than below.

Vomiting.—The three cardinal symptoms, arranged in importance, are vomiting, visible peristalsis and palpable tumor. Vomiting is the most important symptom and is invariably present. Visible peristalsis is present in about 75 per cent. of the cases, and a tumor is palpable in about 25 per cent. Still could feel a tumor in 19 of 21 cases, Downes in every one of 22 cases, and Richter in all of 19 cases. The first symptom usually appears between the second and fourth week; it may appear as late as the eighth week; in one of my own cases the first symptom appeared in the ninth week. Köppen observed a case in which the first symptoms appeared in the third month. Pfaundler has noted the onset—

In	1- 4	days	after	birth	in	25	per	cent.
“	4-14	“	“	“	“	25	“	“
“	2- 3	weeks	“	“	“	25	“	“
“	3- 6	“	“	“	“	25	“	“

Ibrahim, in a collection of 266 cases, noted the onset of vomiting—

1-4 days after birth				in	53	cases
End	of	1st	week	in	24	“
“	“	2d	“	“	58	“
“	“	3d	“	“	64	“
“	“	4th	“	“	34	“
“	“	5th	“	“	11	“
“	“	6th	“	“	14	“
“	“	7th	“	“	3	“
“	“	8th	“	“	5	“

Cases in which the vomiting began after the eighth week were reported by Köppen, Shaw and Eltinge.

The onset is usually sudden. As a rule, the mother can definitely state when the vomiting began. In one case under observation at the milk station, a breast-fed infant, who was doing well up to four weeks, was given a dose of castor oil, and a few hours afterward began to vomit. The case proved to be one of hypertrophic stenosis, as was proved later on the operating table.

I have several times known the symptoms to become manifest after a cathartic had been administered. The vomiting takes place soon after nursing and often while still at the breast. At one time I have seen an infant nurse for forty minutes, during which time it vomited six times, and finally fell asleep exhausted. A stomach tube was introduced immediately afterward, and only 1 ounce of stomach contents could be obtained, which was bile-stained. This case also came to operation and a true hypertrophic stenosis was found. Very often the vomiting is projectile, but not by any means always so; it varies in the same case, at times being forcible and at other times not so. At first the infant vomits no more than it takes, and this is often repeated, but as the disease becomes chronic they do not vomit as frequently, but very often vomit more at one time than they have taken at the last feeding, showing that there is retention in the stomach. In other cases I have been able to aspirate, in the morning, seven to eight hours after the last feeding, from 3 to 5½ ounces of stomach contents. The vomiting is not associated with any dyspeptic symptoms; it is persistent and does not respond to the usual remedies. The milk of four of the mothers was examined, but none showed any gross deviations from the normal. The salts were not examined. The vomitus usually contains no bile; in one of my cases it was found. In the early stages of the disease the vomitus is sweet smelling; later, when there is retention, the vomitus is sour smelling and has the odor of rancid butter, probably due to fermentation of stagnant stomach contents, and part of the high acidity, which is often observed in these cases, is probably due to the acid products of fermentation. At times shreds of blood clinging to mucus are found. For a number of years I have been interested in studying the acidity of stomach contents in these cases and I am thoroughly convinced that the hyperchlorhydria which is sometimes present has no causal relation to the disease, but is probably dependent partly on the same factors to which the disease is due and partly to the fermentation which takes place in the stomachs of these cases.

Some of the severest cases which came to operation had no higher total acidity than 35; one case, which recovered on medical treatment, had a total acidity of 120; it was slightly reduced by antacids, but during convalescence was always about 100 to 120, showing that the acidity was not the cause of the stenosis.

There are two symptoms dependent upon the vomiting—constipation and diminished urine secretion. Constipation is an early symptom and may be very obstinate. If the vomiting be very severe and the stenosis be of a marked degree there may be no milk residue in the stool and in place there may be starvation stools, which may be formed, and are not unlike meconium in appearance. They are usually green or dark brown, contain mucus, epithelial cells, bacteria and secretions of the intestine, but no milk residue. These hunger stools may be present from three to twelve days and still the infant may get well without operation. I have seen an infant who for three days passed meconium-like stools, but who under anesthesia passed a well-formed milk stool. This can only be explained by assuming that a spasm of the intestine may occur in this condition. Pharyngeal, cardiac, and anal spasm and eructations are frequent concomitants of this condition. Loss of weight and emaciation are also dependent on the vomiting and are in direct proportion to the amount of vomiting and the degree of stenosis. In mild cases the loss may amount to 4 or 5 ounces a week; in severe cases it may be 1 or 2 ounces a day. One of our cases lost 19 ounces in thirteen days; was operated and recovered.

Visible Peristalsis.—Visible peristalsis is seen in a majority of these cases; they can hardly be mistaken for intestinal peristalsis. The peristaltic wave usually travels from left to right; sometimes two or three waves may be seen following each other; antiperistalsis has been observed by several writers. Hess was able to produce peristalsis artificially in the newborn by instilling 2 c.c. of 0.4 per cent. HCl. into the stomach. He has on several occasions seen classical peristalsis where there was neither the clinical history nor the clinical picture of stenosis. La Fétra has reported a similar observation. Of course, this does not necessarily exclude latent stenosis. There may have been no clinical stenosis, but there may have been anatomical stenosis in the cases reported by La Fétra and Hess. Holt, on the contrary, lays great stress on the presence of visible peristalsis. He states: "I believe visible gastric peristalsis to be the most important symptom for diagnosis, and I should hardly be willing to make a diagnosis without it." One case which Dr. Hess and I observed together had shown neither visible peristalsis nor could a tumor be felt, but the vomiting was so persistent and the loss of weight so progressive that operation was decided on, and on the operating table a hypertrophic stenosis was found. The visible peristalsis disappears after the infants begin to gain in weight, long after the vomiting has stopped. Associated with visible peristalsis is contracture or stiffening of the whole stomach, not unlike that observed in the uterus during labor. These contractures may last thirty seconds; they are intermittent. There is a marked contrast between the emaciated condition of the lower abdomen and the fullness observed in the stomach region. Often the stomach can be lifted with the hand through the abdominal wall. The distended condition of the stomach often leads to diastasis of the recti muscles. The peristaltic waves may be elicited by striking the stomach region, by pouring a little ice-water or ether on the abdomen, or by allowing the child to nurse or use a pacifier. The waves are usually most clearly visible during or immediately after nursing; peristalsis seems not to be painful. When the infants begin to improve these waves do not appear from one and one-half to two and one-half hours after feeding. The waves do not disappear during sleep and are at times even more conspicuous. Although nursing and the use of a pacifier bring out peristaltic waves, they are very often the producers also of marked spasm of the whole stomach and not infrequently cause vomiting; thus many of these infants do better when the breast milk is administered by gavage or with a spoon.

Palpable Tumor.—A pyloric tumor is felt in only 25 per cent. of the cases. In 415 cases collected by Ibrahim a tumor was felt in 86 cases. Of 31 cases observed by two surgeons, a tumor was found in every case. This discrepancy is probably due to the fact that the surgeon is apt to see only the very severe cases—cases which are very much emaciated and in whom a tumor is more apt to be felt; moreover, the imaginative power of surgeons is proverbial. The tumor is usually felt midway between the navel and the free border of the ribs and a little to the right of linea alba. It is about 2½ cm. by 1½ cm. In a few cases in which it is felt, it can always be felt in the same place and has the same consistency; in other cases it is only felt at times and when felt may change its consistency under the palpating fingers. This would tend to show that the presence of a tumor does not necessarily mean the existence of a hypertrophic stenosis, but rather that spasm of a normal or a slightly hypertrophied pylorus may cause a tumor. The changeability in the form of the tumor certainly suggests that spasm is a factor in its production. The presence of a palpable tumor, therefore, is not an absolute indication for operation, as was formerly thought. A tumor can be felt for many weeks after convalescence has set in.

Pathology.—In the spastic cases, a normal pylorus is found on autopsy. In the hypertrophic cases a rigid cylindrical tumor in the region of the pylorus is found; its dimensions are 2-3.5 cm. by 1.5-2 cm. There is almost invariably found a folding of the mucous membrane of the canal; the stomach is not dilated, and not infrequently it is smaller than normal; its walls are abnormally hard and rigid; in a few cases there is dilatation and thickening of the esophagus. The rigidity of the tumor is due to hypertrophy of the muscular layer; mostly the circular fibers; less frequently there is also hypertrophy of the longitudinal muscle fibers and the submucous coat. Pfaundler differentiates a hypertrophic pylorus from a contracted pylorus (*i.e.,* a stomach in systole) in the following ways:—

(1) A hypertrophic pylorus cannot be relaxed at a pressure of 30 cm. water; a systolic can be so relaxed.

(2) In hypertrophic stenosis the total mass of pyloric tissue is greater than in case of systolic contraction of the pylorus.

(3) Histological section of a systolic antrum measures 3-3½ mm.; that of a hypertrophic 3½-5 mm.

(4) The number of muscle fibers and muscle cells and nuclei are increased in number and size in hypertrophic stenosis. (Bernheim-Kaner.)

Course of the Disease.—The course depends on the degree of obstruction. In mild cases there may be improvement within a few days when the proper measures are instituted, and complete clinical recovery in two to three weeks. In severe cases convalescence is more protracted if it sets in at all. Few cases survive five months if they do not recover; the majority of cases either get well or die before they are four months old. Of 68 fatal cases collected by Ibrahim, 8 died at one month, 27 at two months, 27 at three months, 3 at four months, and 3 at five months. Although clinically the recovery may be rather rapid, anatomically it takes months for the lesion to disappear, if it does so at all. The evidence is rather against the disappearance of the hypertrophy. Many cured cases which came to autopsy from six to twelve months later, from other causes, still showed the tumor, and a marked compensatory thickening of the stomach was found in most of the cases. Several cases have been reported which were cured medically and which some time later swallowed coins and passed them per viam naturalem, thus proving clinical cure. The evidence is therefore in favor of compensation and not of eradication of the lesion. Autopsy on cured cases, on whom gastroenterostomy was performed, invariably showed that the pylorus does not functionate and the tumor is still present, but that all the food passes through the stoma of the gastroenterostomy. The visible peristalsis, the stagnation and the retention of stomach contents and palpable tumor persist for weeks after convalescence has set in. Bernheim-Kaner has found, in a majority of his cases, at the age of two and three years, a distinct motor insufficiency of the stomach associated with hyperchlorhydria. Most writers agree that when a case recovers there is usually no recurrence, whatever the anatomical condition may have been. The most common causes of death are acute inanition, marasmus, often terminated by convulsions; secondary infections, and intoxications with glycosuria from sudden overfeeding.

DIAGNOSIS.

The symptom-complex, vomiting, visible peristalsis and palpable pyloric tumor are pathognomonic of this condition. Even in the absence of palpable tumor and peristalsis a diagnosis of pyloric stenosis can be made in a breast-fed child where the vomiting is persistent, the loss of weight progressive, where analysis of the mother's milk shows it to be of normal percentages, and where all the usual measures fail to give immediate relief.

Roentgen-ray examination of the stomach is not of much value. In cases where there is complete obstruction it may show no transmission of bismuth into the intestine; in cases where the obstruction is not complete it shows delayed transmission of food; but this is not significant, as during convalescence these cases still show delayed transmission and retention of food. Recently, a radiologist told the mother of a patient whom I sent to have a bismuth meal taken and radiographed that the infant would have to be operated on immediately, as the child showed no passage of food into the duodenum after twenty minutes. The infant, however, at time pictures were taken was doing perfectly well, as I only wished the pictures as a control. The clinical findings are therefore far more valuable than the X-ray findings.

Aspiration of the stomach seven to eight hours after the last feeding in cases where there is pyloric obstruction will almost invariably reveal some retention of food. We have been in the habit of aspirating these cases the first thing in the morning, before they received their first feeding. The amount of retention does not run parallel with the severity of the symptoms. In the early stages of the disease there is little retention, on account of the frequent vomiting.

Recently, Hess has suggested the use of his tube for the diagnosis of pyloric obstruction. I have had experience with this tube in 6 cases, and it has been most helpful in every one of them. With this tube one can determine not only the presence of obstruction, but also the degree of obstruction. In the case of simple spasm of the pylorus, we meet with a persistent resistance encountered at the same point whenever we attempt to advance the catheter; the spasm may be felt to relax suddenly and enable us to enter the intestine. Marked pyloric stenosis can be diagnosed from the failure to pass the pylorus after repeated attempts. A mild degree of stenosis, so slight as to allow of the passage of the catheter, cannot be differentiated from simple spasm. Recently I was called to see a case about which there was a decided difference of opinion whether to operate or not; in this case I was able to pass the catheter and decided against operation. The child recovered on medical treatment. In cases in which the catheter can be successfully passed, but which do not respond to treatment, one should try to introduce the Hess retention tube and try to feed the infant through the tube.

Within the last year Pal and others have suggested the use of papaverin (an alkaloid of opium) to differentiate spasmodic from hypertrophic forms of stenosis; in adults it has proven of value. Only Knopfelmacher reports good results in infants. It has also been used therapeutically in spasm cases with varied results. In 2 cases in which I tried it, it produced no results.

As the treatment depends not on the nature of the stenosis, but on the degree of the stenosis, there is not much use of differentiating the spasm cases from those of hypertrophy; however, in some cases it is possible to do so. In the spasm cases there is apt to be a neuropathic history. Heubner has observed this condition in mother and daughter. In older children other nervous manifestations are found, as enuresis nocturna, nervous vomiting, facial phenomenon, restlessness and different kinds of phobias. The peristalsis and the hyperchlorhydria may therefore be of nervous origin. The presence of bile in the vomitus, the intermittence of the symptoms, the sudden and spontaneous cure, the absence of palpable tumor and when present its cord-like nature and its variations in size and form, and its sudden disappearance when recovery takes place, all point to a spastic condition.

TREATMENT.

The treatment may be medical or surgical, depending on the severity and on the surroundings of the case. The prognosis of a case treated medically in a hospital is far worse than that of one treated at home. Hutchison reported 17 cases treated medically at home with no deaths, and 64 cases treated medically in the hospital with a mortality of 78 per cent.

Of 88 cases treated medically, 83 recovered:—

	NO. OF CASES.	RECOVERED.
Heubner	21	19
Bendix	32	30
Hutchison	17	17
Stark	12	11
Block	6	6
	88	83 (94%)

Of 61 cases treated surgically, 47 recovered:—

	NO. OF CASES.	RECOVERED.
Richter	22	19
Scudder	17	13
Downes	22	15
	61	47 (80%)

Of 185 operated cases collected by Fredét (1910), 87 died and 98 recovered:—

		RECOVERED.	DIED.
2	exploratory laparotomies	0	2
11	nature of operation undetermined	2	9
2	pylorectomies	1	1
2	jejunostomies	0	2
39	divulsions (Loreta)	24	15
43	pyloroplasties	29	14
86	gastroenterostomies	42	44

Holt, in a series of 55 cases, had a mortality of 55 per cent.; of 28 patients that were operated, 14 died; of 29 treated medically, 17 died. Of the first 42 operated cases reported in the literature, 50 per cent. died.

It is remarkable how many cases of pyloric stenosis have a tendency to get well in spite of all treatment; there seems to be a turning point for the better in many of these cases. A case may be losing ground slowly for three or more weeks and then may suddenly begin to improve on the same measures practised before. How long one should wait in a case that does not respond to medical treatment before suggesting operative interference depends on the individual case. There are no general indications for operating in these cases. There is only one contraindication, and that is any case in which a catheter can be passed into the duodenum should not be operated. In a hospital, a case of pyloric stenosis, unless it responds quickly to medical treatment, should have surgical interference.

An operation should be recommended: (1) If the infant is puny (5 to 6 pounds) and does not respond to medical treatment within seven to ten days. (2) If the loss of weight is rapid (8 to 16 ounces in one week). (3) If the vomiting persists in spite of all medical treatment. Holt believes that marked gastric retention and absence of fecal stools are indications for surgical intervention. I do not believe that the amount of retention is in proportion to the degree of obstruction. We have had one case from which we could aspirate 4 to 5 ounces three hours after feeding during convalescence. Nor do I believe that the presence of starvation stools *per se* are an absolute indication for immediate operation. There have been cases reported in which starvation stools were passed for from three to twelve days and who recovered on medical treatment.

The aim of medical treatment is: (1) To allay the vomiting by regulating the amount and frequency of feeding and by systematic stomach washing. (2) To increase the tolerance of the stomach for larger quantities of food. (3) To increase the food quantity until the infant receives a sufficient number of calories.

We usually begin with a stomach wash and a twelve to twenty-four hour starvation, only water being allowed. Then the infant is put back on the breast, but only for two to three minutes every eight hours, plenty of water being given between nursings. After two or three days the intervals are made every four hours, and when the vomiting stops the amount of food at each feeding is increased. If there be retention the stomach is washed twice daily. If nursing provokes vomiting, giving drawn breast milk with a spoon or medicine dropper sometimes allays it. Poultices are sometimes helpful. The use of antacids and drugs to check the secretion of HCl., we believe, is useless. Very often when no results are obtained from above treatment, institution of mixed feeding brings about good results; but these infants should never be weaned entirely; we usually begin with skimmed milk and gradually come to use diluted whole milk. Sufficient water should be given by rectum to supply the need. Rectal feeding of breast milk can be carried on only for a short time. Fuhrmann was able to keep the weight of a baby stationary for seven weeks on rectal feeding of breast milk. In some cases ice-cold breast milk is retained when it is not otherwise. When convalescence sets in stomach washing can be dispensed with. Internally, tincture of valerian and opium, and papaverin have been tried with some benefit. When mixed feeding is used, it is advisable to give sodium citrate, 2 grains to every ounce of milk used, to modify the curd and thus facilitate passage of the stomach contents.

ILLUSTRATIVE CASES.

CASE I.* V. M. was the youngest of three children. The first died of inanition at three months and during life presented the same symptoms as the present patient, except that they were more severe and persisted until death. The child probably had a hypertrophic stenosis of the pylorus. The second child is five years old and has always been well. The patient came to our notice at the Vanderbilt Clinic at the age of eleven weeks. At six weeks he began to vomit; the vomiting was projectile and usually took place five to ten minutes after nursing; constipation was obstinate, and there was a steady loss in weight. At the first examination a pyloric tumor could be definitely made out and peristaltic waves were clearly visible. The diagnosis of pyloric obstruction was made. To ascertain the nature of the obstruction Dr. Hess was kind enough to try to enter the duodenum with his duodenal tube. After three or four attempts he was able

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* Case presented before the Pediatric Section, New York Academy of Medicine, May, 1914.

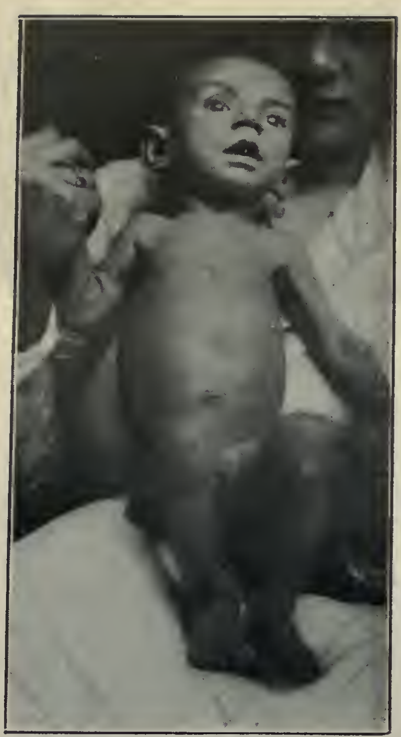

FIG. 1.—Fifteen weeks old; weight, 8 pounds 11 ounces; showing visible peristalsis.

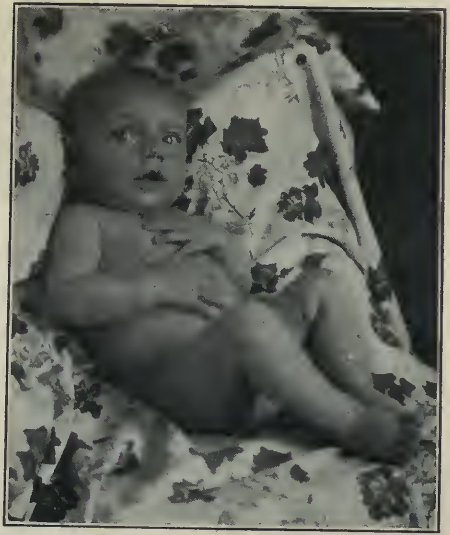

FIG. 3.—Thirty-seven weeks old; weight, 17 pounds 9 ounces; cured.

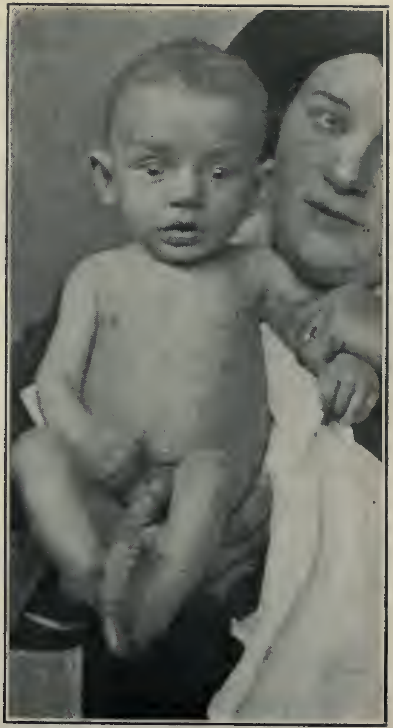

FIG. 2—Twenty-one weeks old; weight, 10 pounds 6 ounces.

to enter the duodenum, thus ruling out organic stenosis of high degree and making the diagnosis of pyloric spasm possible. Three hours after a nursing we were able to obtain from 4 to 5 ounces of rancid stomach contents; an X-ray of the stomach showed delayed transmission of food. The infant was kept on the breast alone for four weeks; the intervals were made three hours. The stomach was washed every day. Under this treatment the infant continued to lose in weight and all the symptoms persisted. An analysis of the stomach contents at this time showed a combined acidity of from 115-85, and no free HCl. By weighing the infant before and after nursing we learned that the infant was getting from 4 to 5 ounces at a feeding and examination of the milk showed it to be of good quality.

In spite of the fact that the breast milk was sufficient after four weeks' trial on the breast alone, we instituted complementary feeding, with the addition of 2 grains of sodium citrate to every ounce of milk used. Immediately the child began to gain in weight and all the symptoms subsided, a pyloric tumor no longer could be felt and the peristaltic waves were no longer visible. The retention in the stomach gradually diminished, and at present only about 2 ounces of stomach contents can be aspirated three hours after a feeding. The combined acidity continued to be from 100-85 and now a trace of free HCl. was present.

The points of interest in this case are: (1) There were 2 cases of pyloric obstruction in one family, both males. In one case the obstruction was of a high grade and led to a fatal termination; in the other it was mild and led to a speedy recovery. These cases lend proof to the theory of Dr. Holt, who, I believe, is of the opinion that in all these cases there is a real stenosis and that spasm is a superimposed phenomenon, but that the stenosis varies in degree in different cases. (2) The almost immediate improvement when complementary feeding was instituted. (3) The immediate disappearance of pyloric tumor and visible peristalsis when the child began to gain. (4) The persistence of the high acidity even when the infant was doing well, proving that the spasm was not due to the high acidity. (5) An X-ray of the stomach taken when the infant was doing well still showed much delayed transmission of food. (6) This case illustrates the presence of both spasm and organic obstruction of a mild degree. The tumor and peristalsis were probably due to spasm of pylorus. The presence of gastric retention and delayed transmission of food during convalescence point either to the presence of a slight organic stenosis or to the fact that the stomach has not yet recovered its full motor power (due to atony from overdistention). (See chart for details.)

Case II. Elizabeth H. was brought to the Pediatric Department of the Vanderbilt Clinic on account of vomiting. Birth was normal and its birth weight was seven and one-half pounds; breast-fed entirely; did well for three weeks, when it was brought to us on account of persistent vomiting, which had lasted three days; constipation was marked; weight at first visit to the clinic was 8 pounds; the vomiting was very frequent, almost after every nursing, often while still at the breast. This infant showed marked lactophobia; it would nurse for a minute or two, then would cry a good deal, probably from pain, due to spasm brought about by the nursing act; would then let go of the breast and after a few minutes would grasp it again. The vomiting was very forcible and projectile; examination of the abdomen was entirely negative; neither peristaltic waves were observed nor could any tumor be felt; there was no stagnation of food nor was there any retention. X-ray showed delayed transmission of food. Examination of the mother's milk showed it to be of normal percentages. In spite of the absence of peristaltic waves and palpable tumor the diagnosis of pyloric stenosis was made. All the usual measures failed to allay the vomiting. Dr. Hess was requested to pass his duodenal catheter, but after a number of attempts he was not able to enter the duodenum, thus proving that we were dealing with a high degree of stenosis. Papaverin was tried, but without any effect. On expectant treatment the weight fell from 8 pounds to 7 pounds in twelve days. For the last three days the infant had been passing starvation stools; the next day the infant had lost 11 ounces (weight, 6 pounds, 5 ounces). In spite of the absence of visible peristalsis and palpable tumor, operation was suggested and carried out the same day at the Babies' Hospital by Dr. Downes. Although for three days previously the infant had been passing meconium-like stools, on the operating table under anesthesia the infant passed a normal milk stool. On opening the abdomen a hypertrophic stenosis was found, and a posterior gastroenterostomy was performed. Eleven days after operation the infant left the hospital with a gain of 6 ounces (weight, 6 pounds, 11 ounces). A few days later we sent the infant back to the hospital on account of the return of the

CASE I. — V. M.

Age in Weeks . . .	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	33	37
Weight	9^{6}		9^{6}	8^{12}	8^{11}	9^{2}	9^{5}	9^{7}	9^{11}	9^{14}	10^{6}	10^{8}	11^{4}	11^{13}	12^{2}	12^{14}	16^{9}	17^{9}
Feeding {B—Breast A—Artificial}	B	B	B	B	B+A	B+A	B+A	B+A	B+A	B+A	B+A	B+A	B+A	B+A	B+A	B+A	B+A	A
Complementary { Mixed Milk ℥ —					9			12				14						32
Boiled ℥ H_2O					12			12				10						10
Milk Sugar {Table Spoonfuls					2			2				3						4
Quantity — Intervals					2½–3			3–3				4–3						7–3
Acidity { Combined .	115	105	95	100	85	75	85	90	100	90	75	95	80	90	100	80		
Free . . .	O	O	O	O	O	O	O	Trace	T	T	T	T	T	T	T	T		
Retention — in OZS.	5½	5	5	4	5	4	3	3	3	2	2	2	4	3	2	3		
Stomach Wash {Times a Week}	6	6	6	5	3	3	3	3	3	3	3	3	3	2	2	1		
Spontaneous Movements						I	I	I	II	II	II	II	II	II–III	II–III	II–III		
Treatment					So. Citrate gr.ii: ℥i			‘‘				‘‘						

vomiting; we passed a stomach tube and obtained bile-stained fluid, thus showing that the stoma was not closed. At the hospital the infant was put on drawn breast milk. The infant was at the hospital five weeks. When it left, the vomiting had stopped and the infant was gaining in weight. A few weeks later the mother's milk diminished in amount and now the infant is entirely artificially fed and is doing well.

The points of interest in this case are: (1) The absence of visible peristalsis and palpable tumor in a case with a high degree of stenosis. (2) The absence of gastric retention on account of the very frequent vomiting. (3) The total acidity never was higher than 35 and free HCl. was always present. (4) The appearance of a normal milk stool after three days of starvation stools. (5) The return of vomiting after operation points to the presence of spasm as a superimposed factor in these cases, as there was no obstruction after operation.

CASE III. Effie M., birth weight unknown; weight at four weeks 7 pounds, six ounces; breast fed; weight at eight weeks, 8 pounds; suddenly began to vomit; vomiting usually occurred immediately after nursing; it was projectile. When it came to my notice the baby was ten weeks old and weighed 7 pounds, 9 ounces. Examination of the abdomen revealed visible peristalsis; no tumor could be felt; examination of the breast milk showed it to be of normal percentages, but was insufficient; complementary feeding was instituted. We began with a skimmed milk mixture, the fat being ½ per cent. Within a few days the vomiting stopped and the peristaltic waves disappeared. Within four weeks the mother's milk disappeared entirely. We gradually raised the fat to 2 per cent. and then began to use a whole milk mixture; at one year the infant weighed 17 pounds and 9 ounces; at two years 26 pounds; and now, almost three years after, the infant weighs 30 pounds; there was never any recurrence of the vomiting. This was evidently a case of simple spasm of the pylorus; the almost immediate subsidence of the symptoms when complementary feeding was instituted is striking.

1967 7th Avenue.

THE UNIVERSITY CHILDREN'S HOSPITAL OF VIENNA

BY A. LEVINSON, M.D.,
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Chicago, Ill.

Vienna has been hailed as the mother of European pediatrics, and its new University Children's Hospital has justly been called the most modern of the world. In 1784 the first findle haus (foundling home) in Middle Europe was established in Vienna. In 1837 Mauthner founded the Wiener St. Anna Kinderspital, the forerunner of the present institution. In this hospital, the first children's hospital to be established in Europe, Mauthner, and, after him, Widerhofer, Mayr and Escherich and scores of assistants, worked for the cause of pediatrics. The new hospital, although built recently, in 1911, embodies the ideas of its founders. It has retained all that was good in the old and added to it the best of the new in pediatrics. The hospital is now directed by a leader in the pediatric world, Professor von Pirquet, who is aided by such an able man as Dozent Schick and numerous capable assistants. These men, who came to the hospital already trained by pediatricians of different institutions, bring with them the ideas of their teachers, thus making it possible for the hospital to embody within itself the best there is not only in Vienna, but in all Europe.

The equipment of the University Children's Hospital is the most complete and most modern in the world, neither money nor energy being spared to make it the most unique in all its branches. The hospital (Fig. 1) covers a space of 3,741 square meters and cost 1,700,000 kronen ($340,000). It consists of one spacious building and two pavilions, one of which is called the Escherich Pavilion, in memory of the man who planned the hospital but did not live to see the full realization of his dream. The other is known as the Widerhofer Pavilion, in honor of the great pediatrician who gave the best in him to the improvement of pediatrics in general and to the St. Anna Spital in particular.

The hospital is divided into the following nine stations: (1) Saüglings, or Infant Station. (2) Tuberculosis Station. (3) Internal Diseases. (4) Diphtheria. (5) Scarlet. (6) Box or Isolation Station. (7) Medicopedagogical. (8) Pharmacologic. (9) Newborn Station.

In addition to the above stations, which are utilized for cases designated by their name, there are two stations or departments which partake of the nature of a laboratory, where patients are referred for examination. These are known as the cardiographic and Roentgenologic stations. There is also a large dispensary, with special rooms for surgery, orthopedics, nose, throat and eye work. Connected with each station is a small laboratory and for the use of all the stations there is a large chemical, a histologic and a bacteriologic laboratory. A large animal stable for experimentation also serves for all the stations. The hospital has, besides, a spacious operating room, a good-sized lecture room, where the students come for their courses, and separate rooms for assistants, attending nurses, wet nurses and maids.

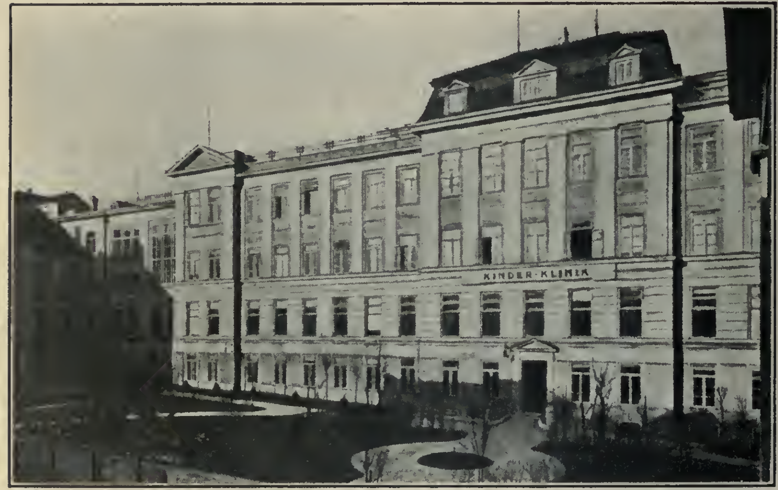


FIG. 1.—Exterior view of the Vienna Children's Hospital.

The patients who come to the hospital for examination are first admitted to the vestibule, where a nurse views them and uses her discretion as to where they belong. The ambulatory patients are sent to the ambulanz (dispensary). Infectious or suspicious infectious cases are taken through a special entrance to the infectious ambulanz, where they are examined by the physician in charge. Infectious hospital cases are sent to the isolation room or box station, and non-infectious cases are directed to the station designed for the treatment of their disease. (Fig. 2.)

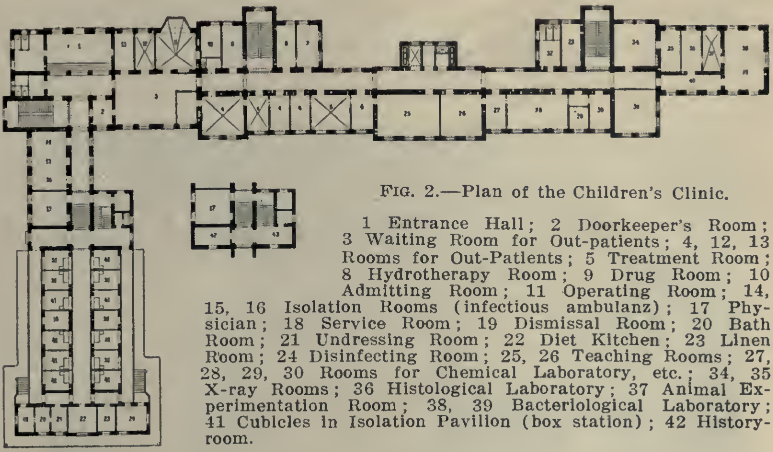


FIG. 2.—Plan of the Children's Clinic.

1 Entrance Hall; 2 Doorkeeper's Room; 3 Waiting Room for Out-patients; 4, 12, 13 Rooms for Out-Patients; 5 Treatment Room; 8 Hydrotherapy Room; 9 Drug Room; 10 Admitting Room; 11 Operating Room; 14, 15, 16 Isolation Rooms (infectious ambulanz); 17 Physician; 18 Service Room; 19 Dismissal Room; 20 Bath Room; 21 Undressing Room; 22 Diet Kitchen; 23 Linen Room; 24 Disinfecting Room; 25, 26 Teaching Rooms; 27, 28, 29, 30 Rooms for Chemical Laboratory, etc.; 34, 35 X-ray Rooms; 36 Histological Laboratory; 37 Animal Experimentation Room; 38, 39 Bacteriological Laboratory; 41 Cubicles in Isolation Pavilion (box station); 42 History-room.

A more detailed description of the various stations follows. It shall be our special concern to point out the salient features of the most important departments.

INFANT STATION.

This station consists of five rooms connected by doors leading from one to the other. There are also separate entrances from the outside to each room, so that it can be entirely isolated if necessary. The station is provided with a bathing room, a small laboratory, and rooms for attending and wet nurses. In addition to these there is an ordinary kitchen upstairs and a milk kitchen downstairs. (Fig. 3.)

Two of the five rooms are kept only for cases of an infectious character, such as tuberculosis and syphilis, the other three being set aside for general diseases. Of the rooms, which are of unequal dimension, the larger contain four beds each and the smaller two. The floors are covered with linoleum; the lower half of the walls with porcelain wainscoting. In each room there is a stove used for heating whenever the heat from the basement is insufficient. The large rooms are supplied with a small writing desk, a box for drugs, and a combination table and cabinet. The table is used for the examination and treatment of children (the opening of abscesses and the like). One compartment of the cabinet beneath the table is used for gauze, cotton, catheters, etc.; the other is utilized for charts, writing paper and other necessary records.

The beds occupy the four corners of each room. They are placed about a half meter away from the radiators and the same distance from the windows. The beds are made of iron sticks, easily opened and closed. Above each bed is a bent iron rod, to which is attached a curtain composed of two halves, which serves as a protection against flies and renders the child's sleep more comfortable. Suspended from the center of the rod is a long silk ribbon—of red if the disease is infectious, blue if it is not. To the ribbons are attached rattles or highly colored playthings, so that the child can play whenever it chooses. Besides amusing the child it helps to develop his psychic power and it often gives information as to his general condition.

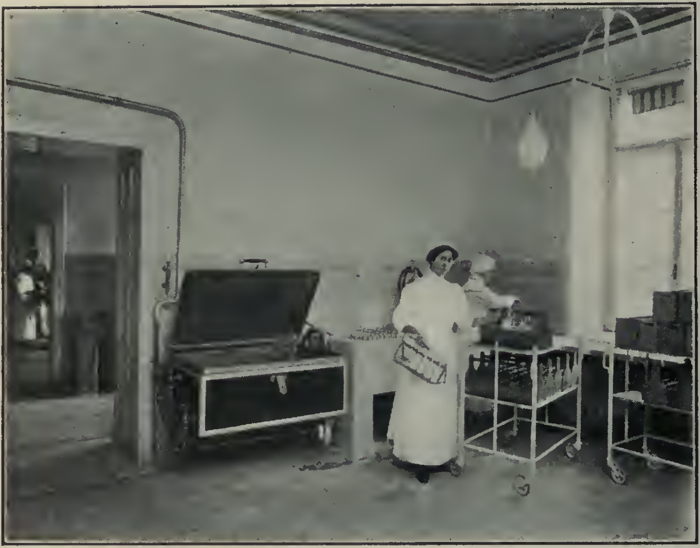


FIG. 3.—Milk kitchen in connection with the infant station.

Under each bed is a white-enameled pail that contains the stool of the child. This is left for the inspection of the assistants and professor when they make their rounds. Beside each bed there is a white metal case with glass windows. This case contains everything that may be needed for the child. In this way the danger of transmitting infection from one child to another is materially lessened.

The medicine case has three shelves, each of which contains a certain number of utensils.

On the lower shelf may be found: (*a*) A small oilcloth used when the child is taken for examination. (*b*) Diaper, which is spread over the oilcloth during examination. (*c*) Bathing cloth.

On the middle shelf are: (*a*) Three bowls, the smallest for washing the eyes, the middle and largest for washing the body. (*b*) Brush.

On the upper shelf are: (*a*) Three medicine glasses. (*b*) Small dish containing glass rod for salve and nickel-wire tongue depressor. (*c*) Nipple holder and nipples. (*d*) Box of lanolin. (*e*) Box of powder.

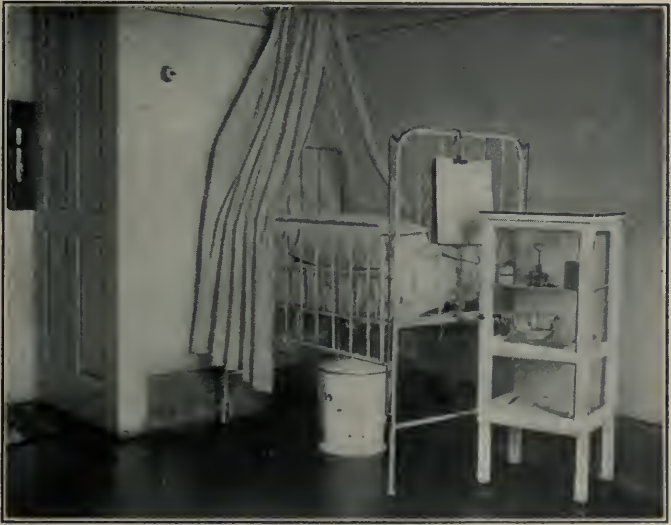


FIG. 4.—Bed in one corner of larger room of infants' station, showing the divided curtain, the pail for stool and the case which contains everything the child needs.

Inside of each case is a small thermometer in its holder. (Fig. 4.)

In addition to the ordinary beds there are two incubators for premature infants. The incubator is an ordinary bath-tub with double walls, the space between being filled with water. The water is changed every day or twice a day, the temperature being regulated by the thermometer in the tub. Aside from the water between the walls, the incubator is a regular bed and may be used for any other infant.

The bathing apparatus is a double one. There is an ordinary small bath-tub and a large apparatus for a shower. This is made after the model of Mozer and can be easily operated and the temperature regulated. (Fig. 5.) After this bath children sleep very restfully. It has also the added advantage of saving the antiseptic cleanings that must be used in connection with any other bath.

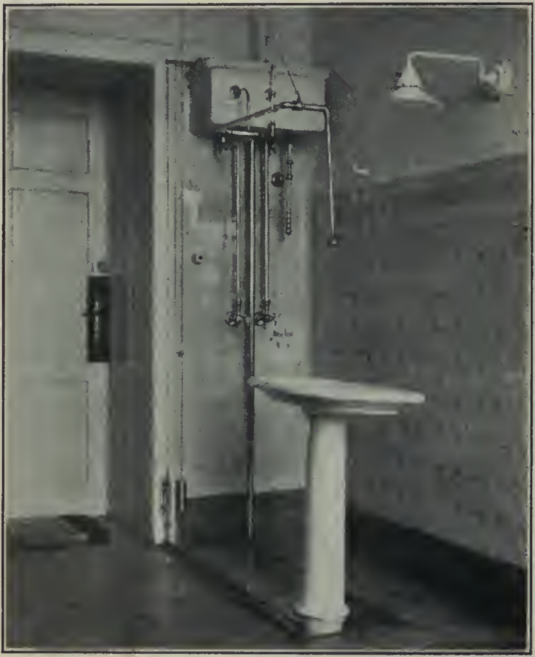


FIG. 5.—Bathing slab with douche nozzle and apparatus for regulating the temperature of bath water.

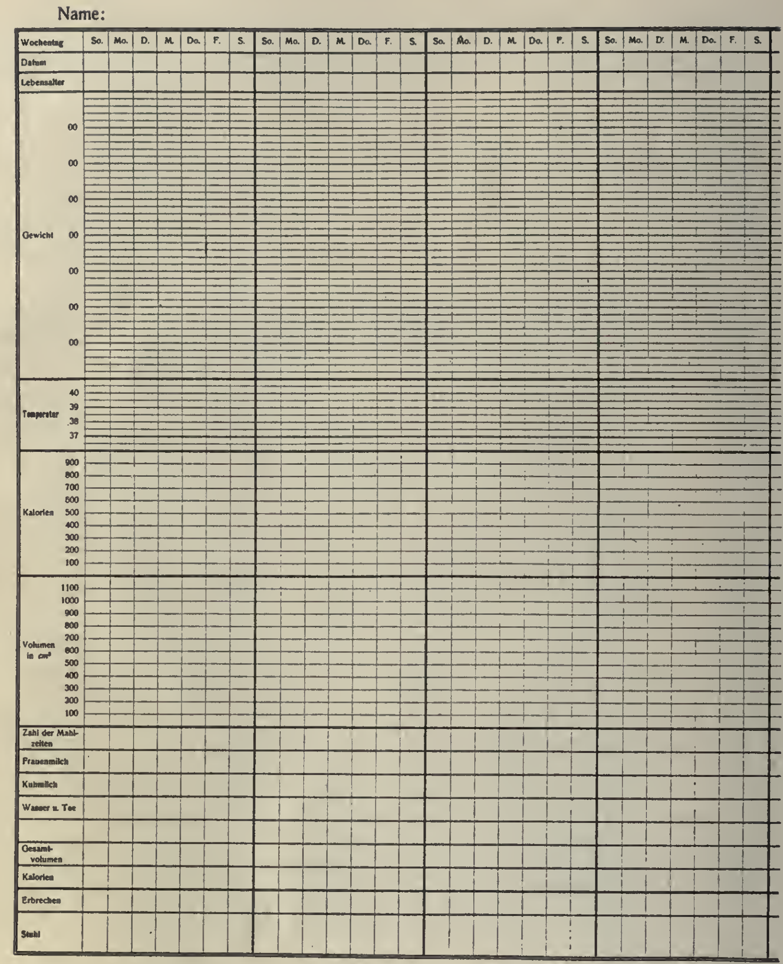
Epstein's masschlitten is the apparatus used for measuring the infant's length. For weight measurement an ordinary steel scale that can easily be disinfected is used. Last year Professor von Pirquet composed a table based on the findings of Camerer, giving the average weight and length at different ages for boys and girls. A mastband, recording these deductions, was then made. This mastband, or measure, is attached to the wall and the child is measured by it. At a glance one can tell the length, weight and what should be the normal figure.

The milk-pump used in the hospital to withdraw milk from the wet nurses is that of Jaschke. This has been found to work very well in most cases, though there are instances where the ordinary milk-pump serves the purpose as well, or even better.

Heat is supplied to the extremities by means of lime bottles filled with hot water, or by triangular-shaped water receptacles made of porcelain.

The chart system used in the infant station is quite unique. Besides the main history and examination chart there are special charts that trace the course of the disease. Various signs and colors serve as symbols. The character of the stools is marked down by signs, | = normal, / = pulpy, : dyspeptic, ω mucus, — fluid, ▭ = soap-stool. The nourishment is marked by colors: red indicates mother's milk; blue, cow's milk; yellow, eiweiss; brown, carbohydrates; black stripes, soup; globules, fat; green, vegetables. The volume of nourishment is written in one line, the corresponding calories in the next line, a ready table being used for that. The same chart contains the temperature, the tuberculin reaction, and any medication administered or any operation performed. Thus one glance at the chart is sufficient to give one an idea of the temperature, the weight, the diet, the stool, the tuberculin reaction and the general condition of the child. The doctor making rounds does not have to go to the trouble of reading the handwriting of different people. The colors tell the whole story. (See chart.) (Fig. 6.)

Although there is no one special rule for feeding infants, each case being treated according to its indications, there is a certain method which is followed in the infant station of the von Pirquet Hospital. Two or three wet nurses are kept on hand all the time (Wassermann being made on them before they are admitted). They nurse their own children and the milk that is left in the breast is withdrawn by pump and given to the other infants. The premature infants are taken care of first and what remains is given to the others. In addition to the immediate supply of mother's milk supplied by the wet nurses, there is a supply of conserved woman's milk made up in accordance with the method of Meyerhofer (½ c.c. H_2O_2 to 1 liter of milk). Infants that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Gesamtvolumen
Kalorien
Erbrechen
Stuhl

FIG. 6.—Reduced fac-simile of the chart used in Prof. von Pirquet's wards. This shows at a glance the weight and the temperature curves, the calories in the food, the volume of food, the number of feedings, the kind of food and the occurrence of vomiting and stools. By a system of characters and the use of colored inks, the physician can tell at once just what the child has received and his condition.

are not fortunate enough to get as much mother's milk as they need receive a modification of cow's milk, the formula being figured according to the caloric value, taking as the standard Heubner's rule. The carbohydrates are, for the most part, in the form of Nährzucker, the use of other forms, such as Keller's malzsuppe or phosphotine, depending upon the condition of the stool. Infants that do not do well on diluted milk, or cases of intoxication, are given Finkelstein's eiweissmilch prepared at the hospital. Seldom is larosan or other modifications of eiweissmilch used. The terminology used in intestinal disturbances is that of Finkelstein.

NEWBORN STATION.

When does the obstetrician discharge the newborn from his care and give it to the pediatrician? In other words, at what age is the pediatrician to begin treating or looking after the child? This question has been solved in the Vienna hospital. Professor Schaut, of the obstetrics department, and the late Professor Escherich recognized the fact that the newborn child, with all of his characteristics and peculiarities, belongs in the realm of pediatrics, and it behooves the pediatrician to take care of it when it is sick and to study its physiologic characteristics when it is well. The best time to begin then is directly after birth. Recognizing this fact, they established a newborn station in the Frauenklinik under the direction of a pediatrician who makes newborn children his specialty. The newborn station, although not located in the same building as the infant station, is considered part of the children's clinic. A large amount of material is available, approximately 70 cases a week. The infants are put in a square wire basket attached to the beside of the mother. In case of infection, however, the children are isolated in special rooms. The infants are observed daily. Physical, chemical and bacteriologic examinations are made and a good deal of information gained thereby, studies having been made in this department on icterus neonatorum, albuminuria, sepsis and many other abnormal conditions.

Newborns that have been in the station for ten days and are still sick are transferred to the Saüglings (Nurslings Stations, where their treatment is continued.

THE ISOLATION OR BOX STATION.

How can we avoid the transmission of infection from one child to another? This has been the great problem in all children's hospitals. Patients affected with the same disease can safely be placed together, but what is to be done with the cases where no positive diagnosis can be made? Isolation answers the question, but is it possible to have an isolation room for each child? As soon as you put two in the same room you expose one to the other's disease. Even where the diagnosis of an infectious disease is clear, who knows if there is not a combination disease; if the child with diphtheria who coughs is not going to develop measles or whooping-cough and infect others?

This big problem has been solved to a certain extent in the Wiener Kinderklinik by means of the Box or Isolation Station. The station consists of twelve glass compartments, or boxes, that fit air-tight into iron frames securely attached to the ceiling and floor. (Fig. 7.) Each box is 2½ meters wide, 4½ meters long and 4 meters high. One side of the thick glass serves as a wall for one box and the other surface as a wall for the next one. Between each three boxes there is a service room where the medical supplies and operating tables are kept. The twelve boxes are arranged in two rows separated from each other by a distance of 2 meters. The intervening space serves as a passage way and makes it possible for parents and students to view the patients without coming into contact with them. (Fig. 8.) The boxes are also separated from the walls by a space of about 1 meter that

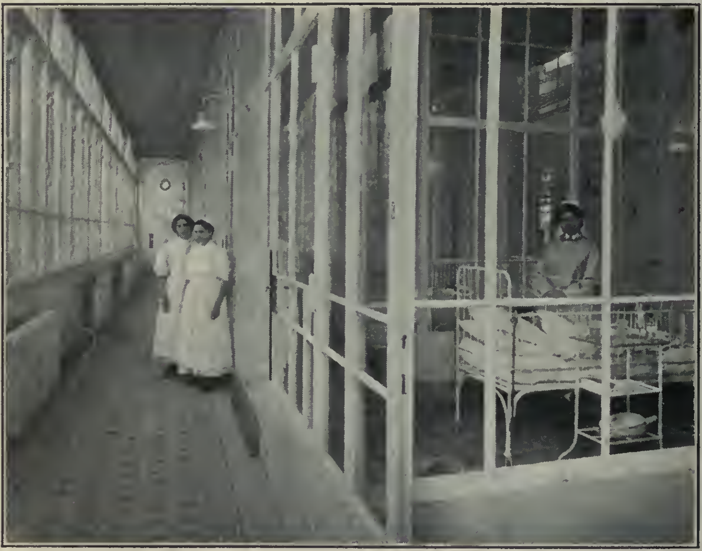

FIG. 7.—Outside corridor in box station. The nurses have access to the boxes through doors opening on to the corridor.

serves as a passage through which patients, nurses and physicians may enter and leave the hospital. Each box has but one entrance that faces the wall. The doors are usually kept open, so that more air may enter the room, and also so that the nurse may hear the child when it calls. Only in cases of measles are the doors closed, because of easy transmission or infection through the air. In all cases ventilation is carried on by means of the ventilators in each box, air entering through two ventilators in the lower part of the wall and leaving through the ventilators at the top after circulating through the room.

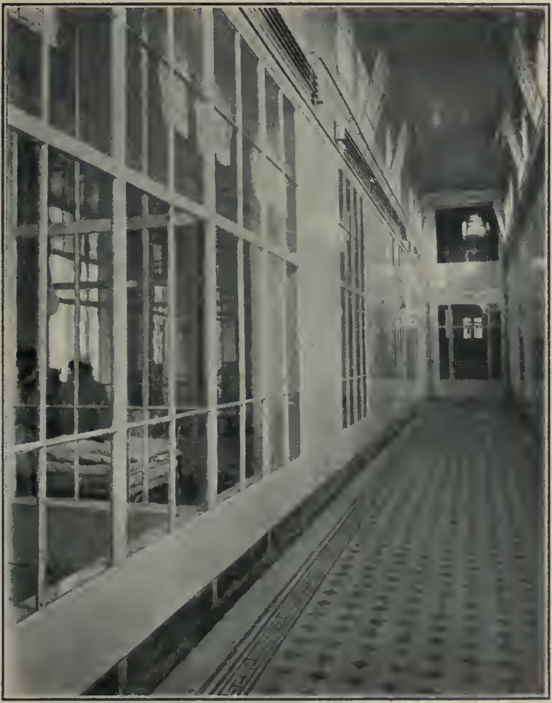

FIG. 8.—Corridor running between cubicles of box station. Parents and students may see the patients without coming into contact with them.

Each box contains a heating apparatus, an iron case for the patient's laundry, brush and comb, a stethoscope, gowns for physicians and nurses, hand solutions and towels. One nurse can attend the patients of all the boxes. All she has to do is to put on a new gown as she enters the box, and to wash her hands as she leaves it, leaving her gown behind her, of course. As a rule, however, there are two or three nurses on each side to facilitate service.

In addition to the twelve boxes, the box station has a tea room, where the food brought from the main kitchen is apportioned, and where the dishes are washed and boiled after eating. It has also a room for laundry and a disinfecting room, which contains kettles with lysoform solution, where the patient's clothes are soaked for from twelve to twenty-four hours before they are given to the regular laundry. There is also a toilet where excreta are emptied, and a formalin oven where history cases and toys are disinfected. The oven closes tightly, the smoke ascending to the chimney without producing any odor in the room.

The advantages of the box system, which are many, can be summarized into the following points:—

(1) Complete isolation can be carried out without the need of much space.

(2) Two cases having two different diseases may lie in adjoining boxes without the transmission of infection. (In this hospital not more than one or two cases a year are carried over from one box to another.)

(3) Many patients can be attended by one nurse, as they can be watched through the glass walls.

(4) Parents can see their children and speak to them and yet not come into contact with them.

(5) Teaching can easily be carried on.

(6) A patient with one disease may leave the box and a patient with a different disease may be brought in an hour later without danger of transmission. All that is necessary is that the floors be wiped and the walls, which are of glass, be washed in an antiseptic solution, something that cannot be done in a room with painted, wooden walls.

MEDICOPEDAGOGICAL STATION.

Of late our interest in nervous diseases has grown stronger, and with this increasing interest has come a good deal of knowledge about the diseases. We now understand the etiology and pathology of many hitherto little known diseases. We have come to realize that many diseases manifesting themselves in adult life have their origin in childhood. We are now cognizant of the fact that the child is subject to perversions and diseases the same as the adult. We have, however, still before us the problem of the treatment of these abnormalities, and the question of the remedies to be applied.

Backward children are usually sent to a physician for psychic examination. The physician, however, is not able to do much for the child, as he has not sufficient time to study the case. To leave a psychically affected child at home will not cure him. He must be removed from the sphere where the disease found its origin. To send such a child to an insane asylum before a thorough diagnosis of his case has been made (and that usually takes a long time), would be pronouncing a death knell on the child; to throw him into a sphere of grown-up degenerates from which he would never free himself. To put such a child in a ward with normal children would mean to wrong other children. What is left to do is to provide a special department in a children's hospital where psychically weak and affected children can be observed, a diagnosis made and treatment outlined. Such a department was established in the Vienna Children's Hospital by

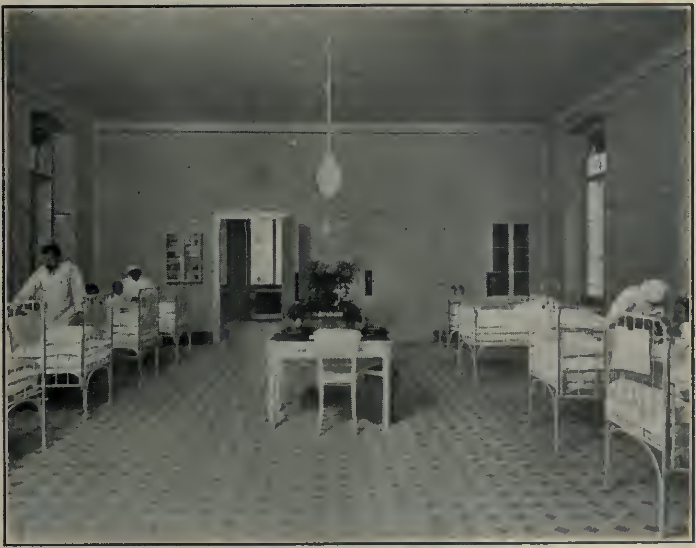

FIG. 9.—Ward in Medico-Pedagogical Station.

Professor von Pirquet in 1911, at the request of one of his assistants, Dr. Lazarus.

The station, which is located in the Escherich Pavilion of the hospital, is known as the medicopedagogical station. (Fig. 9.) It consists of two wards and two small rooms. The latter, which are used for the isolation of subnormal children, accommodate about 15 children at a time. The patients of this station are highly excitable, backward and morally degenerate children. Among them may also be found sexual perverts and children guilty of some criminal misdemeanor. (Fig. 10.)

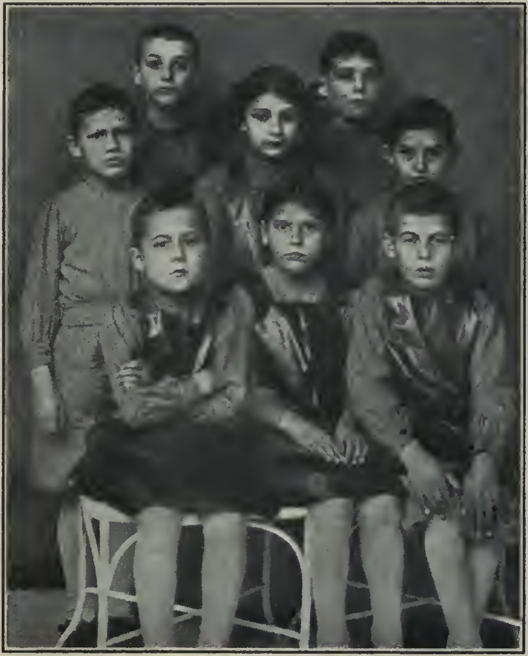

FIG. 10.—Group of patients at the Medico-Pedagogical Station. From left to right: lower row, (1) suicidal tendencies; (2) aphasia; (3) weakmindedness. Middle row: (1) moral defect; (2) hysteric; (3) neurasthenic. Top row: (1) ponomania (wanderer); (2) neuropath.

The patients in this station are sent there by parents, the juvenile court, or some other organizations interested in the welfare of children. The steps taken in the investigation and treatment of the cases are the following: The previous history of the case is secured from the parents, who, as a rule, give their own version of the story. The validity of their statements is then proved or disproved by the additional information received from the police department, school teachers and other interested parties. Wherever possible, the child is encouraged to tell its own story.

A thorough physical examination is then made, special attention being paid to the nervous system. A Wassermann is made in all suspicious cases. Psychic tests are then applied in accordance with the methods of Binet, Simon, Ebbinghaus, Bourdon and Marselon, the tests being repeated every one or two days. After a period of observation extending from a few days to a few weeks, a diagnosis is made, and in addition to that a course of treatment is outlined, so that the persons responsible for the welfare of the child may know what is the best way to remedy its defects. If the home conditions are such that they excite the child easily, he is removed from his home and sent to the home of a friend or to a colony. If there are any removable physical defects the treatment is instituted right at the hospital. The same thing is done in the case of psychic weakness. If the case can do better in an institution it is sent there from the hospital.

The Medicopedagogical Station serves its purpose as a place for the treatment of psychic affections of all kinds, from the harmless stage of weak-mindedness to the pernicious one of criminality. Children have shown marked improvement under its care and many have been restored to happy, normal childhood through its efforts.

THE RELATION OF THE HYPOPHYSIS TO GROWTH AND THE EFFECT OF FEEDING ANTERIOR AND POSTERIOR LOBE.—Lewis and Miller (*Archives of Internal Medicine,* August, 1913) report results of experimental feeding of pituitary extract to white rats. From these and from clinical studies of acromegaly they find no evidence of lessened function of the posterior lobe in explanation of the Frölich syndrome of adiposity and failure of sexual development. Partial removal of the anterior lobe in young animals modifies growth and sexual development in a manner very closely resembling the Frölich syndrome. Removal of the posterior lobe has apparently no effect upon growth.—*Boston Medical and Surgical Journal.*

REPORT OF A CASE OF HYPERNEPHROMA.

BY LOUIS FISCHER, M.D.,

New York.

Jacob P., born April 11, 1893, was first seen by me when eleven years old. He was a breast-fed child. Had measles, whooping-cough, diphtheria and scarlet fever. When three years old the mother noticed that the child was a deaf-mute. He was operated for adenoids, hoping that the removal of any mechanical occlusion of the Eustachian tube might relieve deafness. This deafness developed suddenly after a severe fright. He was brought to me after a weak spell, with a history of pain in the joints and a systolic murmur. A diagnosis of rheumatic endocarditis and asthmatic bronchitis was made. There was wheezing of the chest, some cough, epistaxis, poor circulation and slight jaundice.

The child received his education chiefly through lip reading. His intelligence was normal. He was well-read and had an especial tendency to mechanical work.

I saw this boy, off and on, for a number of years, having an occasional stomach or intestinal indigestion. His development was normal. He studied agriculture and farming during the summer of 1912, and while carrying some boxes on the farm caused some injury which is believed to be the origin of his present illness.

He complained of pains in the right side of head, in the left lumbar region, also pain in the left leg, which was believed to be sciatica. The family visited an osteopath, and after violent osteopathic treatment hematuria set in.

Dr. Francis Hulst examined the urine and reported the following:—

September 18th: Reaction, acid; color, bloody; transparency, cloudy; sediment, blood clot; sugar, none; albumin, large amount; indican, none; specific gravity, 1,025; crystals, none; epithelium, few; pus, none; leukocytes, present; red blood cells, very many; casts, none. Hematuria probably due to hemorrhage into urinary tract, and most probably into bladder.

September 19th: Reaction, acid; color, bloody; transparency, cloudy; sediment, blood cells; sugar, none; albumin, present;

indican, heavy trace; specific gravity, 1,020; crystals, none; epithelium, few; pus, none; leukocytes, moderate; red blood cells, very many; casts, none. Less amount of blood than yesterday and correspondingly smaller amount of albumin. Also indican present in this specimen.

Owing to the continued presence of blood, it was decided to catheterize the ureters. This was done on October 3d, 1912. The report showed that we were dealing with a lesion involving the left kidney.

October 3d: From left kidney: Color, bloody; sediment, red; albumin, trace; sugar, none; indican, none. Sediment.—Red blood cells and few epithelial cells and occasional leukocytes. Stained for tuberculosis. No bacteria found that were acid fast. Some bacilli similar to the colon bacillus, quite numerous.

October 3d: From right kidney: Color, clear, light amber; sediment, none; albumin, faint trace; sugar, none; indican, none; sediment, no blood cells. Few round epithelial cells. No casts. Not stained for tuberculosis.

In addition to the hematuria there was considerable pain in the left lumbar-dorsal region, which led me to suspect a neoplasm. The main symptom which caused disturbance was the persistent renal hemorrhage. Hemostatics, such as gallic acid, ergot and hydrastis, were tried without success. The hemorrhage was first controlled by an injection of 30 c.c. normal horse serum. Several injections were given, so that in all about 100 c.c. were injected. The hemorrhage ceased for ten days. One week after the serum was injected fever and a rash which was erythematous and urticarial in character developed. On this day the patient was seen by Dr. I. Adler, who diagnosed a probable malignancy or tuberculous kidney. The patient was subsequently seen by Dr. Willy Meyer, who diagnosed hemorrhage due to "essential nephritis" or neoplasm.

Meyer also advised a nephrectomy. He catheterized the ureters and localized the lesion in the left kidney.

The following report was submitted by Dr. Frederick Sondern:—

Specimen from left kidney, October 17th: Reaction, acid; sediment, moderate and heavy; albumin, marked trace; urea, 1.14 per cent.; specific gravity, 1,012; sugar, negative; chlorids, 0.6 per cent. Examination of sediment: Blood, moderate amount; pus, none; mucus, none; casts, none found; bacteria, no apparent bacteriuria. No tubercle found. Epithelium, many cells probably referable to the ureter.

Summary.—The specimen from the left kidney shows no more albumin than the blood would seem to account for and there are no elements referable to a lesion of the pelvis or parenchyma to be found microscopically.

The specimen from the right kidney shows no abnormal features. The moderate sediment consists chiefly of superficial epithelium probably from the ureter.

The temperature during the last four days ranged from 100° to 102°, and returned to normal with the disappearance of the exanthematous eruption.

The boy gained in weight and was able to leave his bed. A swelling developed on the left side, over the ninth intercostal space. Phlebotomy was performed by Dr. Sondern, and the human serum thus obtained was injected in doses of 30 c.c., the following day 25 c.c., and on the third day 25 c.c. As no specific hemostatic effect was produced, I secured some blood from the mother of the boy, and injected 50 c.c. of the serum thus obtained. Although less hematuria was noted, the hemorrhage did not entirely cease.

The tumor previously mentioned in the left intercostal space continued to grow and an X-ray examination was made by Dr. Caldwell. This showed the left kidney six inches long, the right kidney four inches long. Caldwell also believed the swelling showed a tuberculous rib.

November 29th, the tumor was markedly increased in size and involved two ribs. The patient complained of intense pain, and a sudden rise in temperature was noted.

The patient was operated by Dr. John Erdman. The tumor excised microscopically proved to be a hypernephroma.

Report of Histological Examination made by Dr. Sondern.—Gross specimen consists of two pieces of rib, each about 4 cm. in length, with considerable soft, greyish tissue with yellow mottlings. The end of one piece of rib is apparently normal; adjoining this it shows general enlargement, elsewhere necrosis with fine needle-like exostosis.

Diagnosis.—Malignant new growth of epithelial type. Microscopically, the tissue consists of a malignant new growth made up of cells of epithelial type with very little connective tissue stroma. The cells are large and of fairly uniform size; it is possibly a hypernephroma. The individual cells and their arrangement are, however, not typical of hypernephroma. The cells are less vacuolated and they show in places a definite tendency to tubular formation which rather strongly suggests carcinoma. There is a great deal of necrosis and acute inflammatory infiltration with some intestinal hemorrhage.

The patient made an uneventful recovery and was discharged one week later from the hospital.

Dr. Sondern made a microscopic examination of the urine sediment, and reported the sediment searched for tissue elements with negative result.

As the hematuria reappeared, and pains in the region of the cervical vertebræ developed, it was thought advisable to have an X-ray of the long and flat bones from the neck downward. Distinct evidence of carcinoma was found in the scapula, also in the neck of the left femur. The vertebra, also the liver, showed large shadows with suspicion pointing toward carcinoma.

The following report was submitted by Drs. Caldwell and Imboden:—

We have made a series of X-ray plates covering the entire skeleton from the fifth cervical down. We find no evidence of further disease in any of the ribs. The only definite evidences of diseased bone that we observed are in the left scapula and the neck of the left femur. There is a diseased area which includes the glenoid fossa and extends over the neck internally for a distance of two inches. Over this area a peculiar mottling is shown, which gives evidence of a serious disturbance of the bone substance, but which is not typical of carcinoma. In the neck of the left femur there is a small circumscribed area about five-eighths of an inch in diameter and about opposite the middle of the intertrochanteric line. This spot is very similar to others which I have observed, and which have proven to be carcinoma.

Although we find no definite indications of disease, we would like to examine again the first plates made (which are in your possession) in order to look for evidence of trouble in the bodies of the lumbar vertebræ. If there is carcinoma in these regions there must be also carcinoma of some soft viscus. The liver shadow is unusually large.

The radiographic examination previously referred to showed evidences of metastatic growths in so many different parts of the body that surgical intervention was contraindicated. Both the long and the flat bones and the vital organs, such as the liver and kidney involvement, gave a poor prognosis from an operative point of view. It was therefore decided to try the value of colloid copper injected by the intravenous method.

In January, 1913, I sent the boy with a trained nurse to Dr. Loeb, of St. Louis. His treatment began January 26th, with an injection of 4 c.c. in the median basilic vein. Two hours later there was a chill, followed by a rise in temperature to 104.4°, for which whiskey and strychnin were given. Later, pain in the tumor in the back of the head was relieved by 5 grains of aspirin. Dr. Lyons, as assistant to Dr. Loeb, gave injections almost daily in quantities of 50 c.c., gradually increased to 250 c.c. After several months of this treatment, during which time there was a decided improvement, the patient returned. The psychic effect produced by the change in treatment was certainly of great value to the patient. Progressive emaciation set in with extreme suffering, which required opiates. The patient died the end of April, 1913, or about three months after being sent to St. Louis.

A NEW STAIN FOR TUBERCLE BACILLI.—F. Mass y Magro (ref. *Münch. Med. Woch.,* 1913, No. 6, p. 319). The stain is as follows: (1) The sputum is spread on a slide and dried. (2) Fixation in the flame or by half an hour at 120°C. (3) Stain for three minutes in Gosio's stain, warming three or four times until a light steam arises. Gosio's stain consists of methylene-blue medic. Hoechst, 3.0; borax, 5.0; distilled water, 100.0. The solution must be old or have been kept uncovered in a thermostat at 37°C. for several days, with frequent shaking. (4) Place the specimen for three to four seconds in 25 per cent. sulphuric acid and (5) for forty seconds in absolute alcohol. (6) Dip into a mixture of equal parts of Elsbach's solution and absolute alcohol. (7) Wash in hydrant water; dry. (8) Decolorize in a solution of 50 per cent., alcohol, 100.0; sodium hydrate, 0.5; potas. iodid, 1.0. (9) Wash first with hydrant, then with distilled, water. (10) Dry and mount. This method stains the tubercle bacilli a rosy red, their intrabacillary granules dark red, all other bacteria and cells blue. It is said to surpass all previous methods.—*Interstate Medical Journal.*

OBSERVATIONS ON THE USE OF STOELTZNER'S CASEIN-CALCIUM MILK IN THE TREATMENT OF SUMMER DIARRHEAS OF INFANCY AND EARLY CHILDHOOD.

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Up to a short time ago, the management of the diarrheas of infancy and early childhood consisted in the main of starvation, purgation, colonic irrigation, barley and rice water, bismuth and opium preparations. Nearly all the writers on this subject were of the opinion that the taking of even a moderate amount of food was adding fuel to the fire. Often milk starvation as a mode of treatment was persisted in for one or more weeks with the result that many children lost a good deal of weight and a reduction in their food tolerance followed.

Finkelstein and Meyer were among the first to study these cases carefully, and point out the disastrous results following this method of treatment. It is not my intention to go into detail and show why eiweissmilch (protein milk) was used in these nutritional disturbances and the method of its administration; suffice it to say, that those who have used this milk according to the detailed directions of the authors are unanimous in their opinion that it is the best means we have to-day of combating these diarrheas. In private practice where protein milk can be conveniently obtained from the milk laboratory and in hospitals where the trained dietitian may really prepare it, this milk can be more generally used. But when employed in the out-patient departments of our large institutions, where poverty is great and ignorance is rampant, protein milk has two great disadvantages: first, its expense, and second, the difficulty of its preparation.

Engel St.,[1] Heim and John,[2] and Feer[3] have simplified the method of making protein milk; more recently Stoeltzner[4] of Halle, believing that the specific effect and therapeutic value of protein milk are due to the high percentage of casein and calcium, made experiments to obtain a calcium caseinate in such form that it could readily be added to varying dilutions of milk, thereby increasing its casein-calcium content and thus overcoming the great difficulty of preparing protein milk. He proceeded as follows: One quart of fat free milk was diluted with four times the quantity of water slightly acidulated with acetic acid; the precipitated casein was thoroughly filtered and dissolved in a weak solution liquor potassæ, then again slightly acidulated; the precipitate was now redissolved in water, the total quantity of casein determined and 2.5 per cent. calcium oxid added.

It was only after a long series of experiments that he succeeded in obtaining a casein-calcium in the form of a white, fine granular powder, readily soluble in hot milk, neutral in reaction and tasteless. When 20 grams (⅔ ounce) of casein-calcium is added to one liter of half milk, "casein-calcium milk" is formed, whose percentage composition is practically that of Finkelstein and Meyer's protein milk.

COMPARISON.

One Liter Casein-Calcium Milk.		*One Liter Protein Milk.*		
Albumen	3.4%	Albumen		3.0%
Fat	1.7%	Fat		2.5%
Sugar	2.2%	Sugar		1.5%
P_2O_5	.12%	P_2O_5	%	.12
CaO	.13%	CaO		.14%

Specific directions to mothers are as follows: In about ⅓ of a pint of milk dissolve 20 grams of casein-calcium; in the meantime heat ⅔ of a pint of milk, mix the cold solution of casein-calcium milk with the hot milk, boil the whole five minutes, stirring constantly; this makes a smooth, homogeneous mixture of thin cream consistency; to this add one pint of boiled water or cereal decoction.

Stoeltzner[5] reports 76 cases treated with this milk in which the results compared very favorably with Finkelstein and Meyer's protein milk in that fatty soap stools were soon formed and the tolerance increased for ordinary cow's milk. Bertlich[6] treated about 200 cases with this milk and claims to have obtained very good results. His series included acute and subacute dyspepsia, decomposition, alimentary intoxication, parenteral infection and Mehlnärschaden.

Ostrowsky, J.,[7] studied the action of casein-calcium milk in combination with breast-feeding in 49 cases. These included dyspepsia, decomposition, intoxication, rachitic and healthy children. He sums up his results as follows: The tolerance for cow's milk is increased; the milk is indicated in decomposition, dyspepsia and mild forms of alimentary intoxication; it is useful in parenteral infection; as a dietetic remedy, it is of great service, even in the very young nurslings when the addition of food is necessary.

Beck, C.,[8] treated 50 cases with casein-calcium milk; the infants ranged in age from 2 weeks to 1 year; his cases included dyspepsia, enterocolitis and decomposition. The results were as good as with protein milk.

Wegener[9] observed 22 cases varying in age from 22 days to 20 months. His series included acute dyspepsia, decomposition, alimentary intoxication, Mehlnärschaden, parenteral infection and chronic dyspepsia. All the children took the food well, stools improved by the third day; body weight increased perceptibly; no disturbance followed when a sudden change was made from casein-calcium milk to the regular diet. Wehner,[10] Forcart,[11] Curschman,[12] Strowsky, J.,[13] Kamnitzer, Hans,[14] and Föhrenbach,[15] have treated varying numbers of infants and report that their results are as favorable as those with Finkelstein and Meyer's protein milk.

During the past summer I have used this milk in the treatment of 56 cases of summer diarrhea in the out-patient departments of the Mt. Sinai Hospital, Bronx Hospital Dispensary and in private practice. No patient ill less than 3 days is included in this series.

Age varied from 3½ months to 2½ years. Many of the children were rachitic, anemic, poorly nourished, underdeveloped and underweight.

Method of Administering Casein-Calcium Milk. The original formula was adhered to as a rule; dextrimaltose was rarely added before the third day; in about 50 per cent. of the cases, cereal decoction was employed instead of water; small amounts were given at 4-hour intervals; water *ad libitum* if necessary; the total quantity of food was increased from 2 to 4 ounces daily, depending upon the condition and age of the child. It was well taken by all except one. This was a child of two years, extremely difficult to manage by the mother. This milk was given for periods of time varying from four days to several weeks. No vomiting occurred.

A district nurse visited all of the out-patients and demonstrated its preparation; the mothers experienced little difficulty in making this food after being shown once.

Stools.—All cases showed improvement in about 4 days, in most children in 2 days assuming a yellowish color, semi-solid, one or two daily.

Weight.—About 49 per cent. gained and 21 per cent. remained stationary; in 30 per cent., the weight could not be observed on account of the very irregular attendance of the mothers. These cases were visited by a district nurse who reported their conditions.

My observations lead me to the following conclusions:—

(1) Casein-calcium milk employed in dyspepsia (Summer Diarrhea) is productive of results rarely attained with the older methods of treatment.

2. On account of the simplicity of its preparation and inexpensiveness, it is particularly useful in the management of nutritional disturbances applying to our out-patient departments for treatment.

3. It may be readily used in those nutritional disturbances where Finkelstein and Meyer's protein milk is indicated, but cannot be employed on account of its expense or taste.

CASE REPORTS.

1. SHOWING GAIN IN WEIGHT.

CASE 1. July 7, 1914. B. T., male, 16 months, weight 20 pounds 6 ounces, diarrhea for 1 week, 5-8 green, slimy stools daily, restless, loss of appetite, tenesmus, temperature, 101°. This child had received the usual treatment without any satisfactory results, except that he developed opium poisoning (pin-point pupils, persistent sleep for 12 hours). Treatment: Casein-calcium milk 4 ounces, q. 4H., increasing daily 3 ounces if stools improve, until 8 ounces q. 4H. are taken; cereals to be added then.

July 12th. Very much better stools, yellow, semi-solid, 2 times daily; weight 20 pounds 10 ounces. July 25th. Stools once daily; weight 21 pounds 2 ounces. Regular diet.

CASE 2. July 15, 1914. M. K., female, 2½ years, weight 27 pounds 6 ounces, diarrhea for 2 weeks on and off; 4-5 green slimy stools daily, restlessness, colic, no fever, no vomiting. Treatment: Casein-calcium milk 5 ounces, q. 4H., increase 4 ounces daily if stools improve. July 18th. Stools two times daily, yellow, semi-solid, cereals added. July 25th. Stools twice daily, yellow and soft, weight, 27 pounds 10 ounces.

Case 3. July 18, 1914. S. K., male, 10 months, weight 16 pounds, diarrhea for 3 days, 8-10 greenish watery movements daily, no fever, vomited twice. Treatment: Casein-calcium milk 3 ounces, q. 4H., increase 3 ounces daily if stools improve up to 6 ounces, q. 4H. July 25th. Stools once daily for past 2 days, yellowish, semi-solid, takes food very well; weight 16 pounds 5 ounces. Casein-calcium reduced, milk increased. Recently mother reported child perfectly well.

Case 4. July 16, 1914. R. J., female, 16 months, weight 18 pounds, diarrhea for 1 week, 4 greenish slimy movements daily, colic, marked excoriation about anal region. Treatment: Starvation, barley water. Bismuth and opium mixture, q. 3H. (This was because mother would rather give medicine than prepare food at this time.) July 21st. Condition the same, no improvement. Treatment as above continued. August 18th. Patient returned still having 5-6 green watery movements daily. Weight 18 pounds. Treatment: Casein-calcium milk 5 ounces, q. 4H., increased 2 ounces daily. August 20th. Stools yellowish, 3 times daily, occasionally admixed with green. August 25th. Stools 2 times daily, semi-solid, yellow. August 27th. Stools once daily, is taking 8 ounces, q. 4H., some weak tea and boiled rice. Weight 18 pounds 8 ounces. This was the worst case we had to deal with; the mother was exceedingly stupid and insisted on doing things her way; we finally had a district nurse visit her daily until child's condition improved.

Case 5. July 24, 1914. I. L., female, 18 months, weight 22 pounds 2 ounces, diarrhea on and off for 1 month, 5-6 green slimy stools daily, vomits occasionally, colic, at times tenesmus; child had received the usual mode of treatment with no improvement. Treatment: Casein-calcium milk 5 ounces, q. 4H. increase 3 ounces daily if stools improve. August 5th. Stools yellow for past 3 days, 2 times daily. August 12th. Stools 2 times daily, takes 8 ounces q. 4H. Cereals ordered. Casein-calcium discontinued. Regular diet ordered. Weight 22 pounds 6 ounces.

Case 6. July 25, 1914. B. M., male, 17 months, weight 27 pounds 2 ounces, diarrhea and vomiting frequently for 10 days, 4-6 greenish watery occasionally slimy stools daily, temperature, 99.5°F. Irritability. Had received the usual treatment without results. Treatment: Casein-calcium milk 5 ounces, q. 4H. Water *ad libitum,* increase food 3 ounces daily as stools improve. August 1st. Mother reports child feeling much better for past 3 days. Stools 3 times daily and cereals added. August 12th. Stools once daily, yellow, well formed. Weight 27 pounds 12 ounces. Casein-calcium discontinued.

Case 7. July 25, 1914. A. M., male, 6½ months, weight 15 pounds, diarrhea for 1 week, 4-5 greenish watery stools daily. No fever, no vomiting, bottle fed. General condition good. Treatment: Casein-calcium milk 3 ounces, q. 4H., increase 2 ounces daily. August 1st. Bowels move one or two times daily for past 4 days. Well formed. Weight 15 pounds 3 ounces.

Case 8. July 30, 1914. S. G., male, 15 months, weight 12 pounds, diarrhea for 3 days, 3-4 green watery movements daily, occasionally slimy, some tenesmus, no vomiting, no fever. General condition poor, weight has been going up and down for 1 month. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily. August 1st. Stools yellow, well formed, 2 times daily, weight 12 pounds 1 ounce, child comfortable. Casein-calcium reduced, milk increased. August 8th. Stools one or two daily, yellow, semi-solid. Weight 12 pounds 5 ounces; casein-calcium discontinued. August 18th. Diarrhea for 2 days, 4 yellowish watery movements daily. Treatment: Casein-calcium again added to milk. August 23d. Stools once daily, well-formed. Weight 12 pounds 9 ounces. Ordered continued, reducing casein-calcium to 10 grams, milk, 1 liter, to be gradually increased. September 5th. Child looks well, acts lively. Weight 13 pounds 1 ounce. Dextri-maltose 3 per cent. added. September 12th. Stools once daily, yellow. Weight 13 pounds 11 ounces. Ordered casein-calcium discontinued.

Case 9. August 6, 1914. B. E., female, 6 months, weight 15 pounds 3 ounces, diarrhea for 4 days, 5-8 slimy, foul-smelling stools daily, occasionally greenish and watery. Bottle fed. Treatment: Casein-calcium milk 3 ounces, q. 4H. August 8th. Stools 2 times daily, increased milk to 5 ounces, q. 4H. August 11th. Stools once daily, weight 15 pounds 6 ounces. Milk increased, casein-calcium diminished. August 22d. Stools once daily, yellow, well-formed. Weight 15 pounds 11 ounces. Regular diet resumed.

Case 10. August 7, 1914. B. W., male, 6 months, weight 16 pounds 11 ounces, diarrhea on and off for past month, 5-6 greenish slimy or watery stools daily. Vomits occasionally, no fever, is breast-fed, has received the usual treatment. No results. Treatment: Repeated as above with regulation of breast-feeding. August 10th. No improvement. Treatment: Casein-calcium milk 2 ounces, q. 4H., alternate with breast-feeding, increase 2 ounces daily for 3 days. August 14th. Stools yellow, 2 times daily, semi-solid, weight 17 pounds 5 ounces. Child has cough for two days (Bronchitis). August 28th. Stools once daily, yellow color. Weight 17 pounds 8 ounces. Casein-calcium discontinued.

Case 11. August 6, 1914. S. F., 3½ months, weight 11 pounds, diarrhea for 3 days, 5-7 green, slimy movements daily, no vomiting, no fever, bottle-fed. Treatment: Casein-calcium milk 2½ ounces, q. 4H., increase 2 ounces daily as stools improve until 4 ounces q. 4H. are given. August 18th. Stools twice daily for about a week, yellow in color. Weight 11 pounds 4 ounces. Casein-calcium gradually discontinued.

Case 12. August 10, 1914. I. K., female, 15 months, weight 20 pounds 12 ounces, diarrhea for 1 week, 4-6 greenish watery movements daily, sometimes slimy, loss of appetite, no fever, no vomiting. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily. August 17th. Stools 2-3 times daily, yellow, semi-solid. Weight 20 pounds 14 ounces, casein-calcium discontinued 2 days later.

Case 13. August 12, 1914. S. S., male, 1 year, weight 23 pounds 14 ounces, diarrhea for 5 days, stools 4-5 times daily, green and watery, no vomiting, temperature 100°. Treatment: Casein-calcium milk 4 ounces, q. 4H. August 14th. Stools 3 times to-day, yellow, semi-solid, food increased to 8 ounces, q. 4H. August 17th. Stools 2 times daily, yellowish, semi-solid. Weight 24 pounds 2 ounces. Casein-calcium discontinued. Regular diet ordered.

Case 14. August 13, 1914. J. L., female, 7½ months, weight 15 pounds 3 ounces, diarrhea for 5 days, stools 5-7 times daily, greenish and watery, blood-streaked, tenesmus. Breast and bottle-fed. Had received the usual treatment with no results. Treatment: Casein-calcium milk 3½ ounces, q. 4H., alternate with breast. August 15th. 3 stools daily, semi-solid, belches a good deal. HCl. dilute given P. C. August 22d. Belching ceased, stools once daily, yellow, weight 15 pounds 6 ounces.

Case 15. August 13, 1914. A. G., male, 6 months, weight 15 pounds 15 ounces, diarrhea and fever for 1 week, stools green and watery 4 times daily, colic, bottle-fed. General condition good. Treatment: Casein-calcium milk 3 ounces, q. 4H., increase 2 ounces daily. August 25th. Bowels moved 2 times to-day, yellow, no colic. Weight 16 pounds 5 ounces. Ordered milk increased, casein-calcium diminished.

Case 16. August 17, 1914. M. L., male, 1 year, weight 18 pounds 11 ounces, diarrhea for 5 days, 5-6 greenish mixed with yellow stools daily. No vomiting, feverish occasionally. Treatment: Casein-calcium milk 4 ounces, q.4H. Water *ad libitum*. Increase 3 ounces daily. August 19th. Bowels moved 3 times, yellowish and semi-solid. Ordered 6 ounces, q. 4H. August 21st. Child constipated since yesterday. Weight 18 pounds 13 ounces. Casein-calcium reduced one-half, milk increased. August 28th. Bowels frequent 3-4 times daily, yellowish, casein-calcium increased. September 2d. Stools semi-solid, 2 times daily. Cereals ordered in addition. September 9th. Stools well-formed, yellow, once daily. Weight 19 pounds 12 ounces.

Case 17. August 18, 1914. I. S., male, 9 months, weight 15 pounds, diarrhea for 3 days; about 10 green blood-streaked movements daily, no vomiting, temperature 99°. General condition fair. Mother claims child does not seem to gain. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily. August 22d. Stools yellow, once daily, semi-solid. Weight 15 pounds 7 ounces. Ordered food continued for another week.

Case 18. August 19, 1914. W. E., male, 1 year, weight 22 pounds 14 ounces, diarrhea for 2 weeks, stools 4 times daily, green and watery, occasionally slimy, vomits occasionally, temperature 100°. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily if vomiting does not occur. August 21st. stools yellow, semi-solid, 2 times daily. Child comfortable, food increased to 8 ounces, q. 4H. August 24th. Stools 2 times daily, yellow. Weight 23 pounds 2 ounces.

Case 19. August 20, 1914. M. G., male, 4 months, weight 14 pounds, diarrhea for 1 week, 5 greenish slimy foul-smelling stools daily, vomited several times, temperature 100°. Breast-fed. Has tried the usual method of treatment with no result. Treatment: Casein-calcium milk 2½ ounces daily, q. 4H., alternating with breast feeding, increase 2 ounces daily for 3 days. August 25th. Stools move twice daily, yellow, semi-solid. Child comfortable. Weight 14 pounds 2 ounces. Casein-calcium discontinued 3 days later.

Case 20. August 22, 1914. E. F., female, 13 months, weight 21 pounds 6 ounces, diarrhea for 3 days, 10 greenish slimy stools daily, tenesmus, no vomiting, no fever. Treatment: Casein-calcium milk 4 ounces, q. 4H., water *ad libitum.* Increase milk 2 ounces daily. August 27th. Stools yellow, semi-solid, 2 times daily, no tenesmus. Child comfortable. Weight 21 pounds 12 ounces.

Case 21. August 24, 1914. Y. L., female, 8 months, weight 13 pounds 9 ounces, diarrhea for 1 week, 6-10 greenish watery movements daily, occasionally yellowish watery, slight fever, vomited several times. Treatment: Casein-calcium milk 4 ounces, q. 4H. Vomiting does not recur, increase 2 ounces daily. September 4th. Stools yellow, 2-3 times daily, feels good, is contented. Weight 13 pounds 11 ounces. Food continued for another week, increasing milk and diminishing casein-calcium.

Case 22. August 25, 1914. E. M., male, 8 months, weight 15 pounds, diarrhea for 1 week, 4-6 greenish watery stools daily, occasionally brownish, a good deal of colic, vomits, no fever, diet, malt soup mixture. Treatment: Casein-calcium milk 3½ ounces, q. 4H. increasing 2 ounces daily as vomiting ceases. August 27th. Bowels moved 2 times daily yesterday and to-day, semi-solid. September 3d. Stools once daily, no movement since yesterday. Child belches. HCl. dilute given after feeding, reduce casein-calcium, increase milk. September 5th. Bowels move once daily, stopped belching, takes food well, 8 ounces, q. 4H. plus 3 per cent. dextri-maltose.

Case 23. August 26, 1914. A. J., male, 15 months, weight 19 pounds 8 ounces, diarrhea for 1 week, 5-6 greenish watery movements daily, occasionally yellowish and slimy. Treatment: Casein-calcium milk 4 ounces, q. 4H. Weak tea with saccharine *ad libitum.* Increase food 2 ounces daily for 2 days. September 2d. Stools well-formed, 3 times daily, yellow, no vomiting. Weight 19 pounds 13 ounces. Ordered cereals and egg daily. September 11th. District nurse reports child is well, bowels move once daily and is gaining in weight.

Case 24. September 3, 1914. L. M., male, 9 months, weight 18 pounds 9 ounces, diarrhea for 2 weeks, colic, stools 4 times daily, green and slimy; no vomiting, breast-fed. Treatment: Casein-calcium milk 4 ounces, alternating with breast, q. 4H., increase 2 ounces daily. September 8th. Stools better, once daily, yellow. Weight 18 pounds 14 ounces.

Case 25. September 3, 1914. B. G., male, 1 year, weight 16 pounds 13 ounces, diarrhea and vomiting for 4 days, about 10 green watery movements daily, no fever, diet condensed milk and rusk, had received the usual treatment without results. Treatment: Casein-calcium milk 3 ounces, q. 4H., increase to 4 ounces after vomiting ceases, then increase 3 ounces daily. September 8th. Stools once daily, yellow, semi-solid, no vomiting. Weight 17 pounds 2 ounces. Casein-calcium diminished, milk increased.

Case 26. September 8, 1914. I. M., 14 months, weight 21 pounds 1 ounce, diarrhea for 3 days, about 12 green watery movements daily, no vomiting, temperature 99½°, general condition good. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily. September 13th. Stools yellow, 2 times daily, semi-solid. Weight 21 pounds 5 ounces. Takes food well; ordered cereals, reduction in casein-calcium and increase in the milk.

Case 27. September 8, 1914. S. T., female, 22 months, weight 23 pounds 2 ounces, diarrhea for 5 days, 4-5 green curdy stools daily, loss of appetite, no vomiting, no fever. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase to 6 ounces, q. 4H. in 24 hours if stools become less frequent. September 12th. Stools once daily for past 2 days, yellow in color. Weight 23 pounds 4 ounces. Ordered regular diet.

CASES PRESENTING THEMSELVES AT THE CLINICS AT LEAST TWICE, SHOWING NO GAIN IN WEIGHT.

Case 1. July 10, 1914. Male, 18 months, weight 19 pounds 7 ounces, diarrhea for 4 days, 5-6 green watery movements daily, restlessness, loss of appetite, temperature 100°. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 3 ounces daily, water *ad libitum.* July 13th. Stools better, yellowish, 3 times daily. July 15th. Stools 3 times daily, yellow. Weight 19 pounds 7 ounces.

CASE 2. July 20, 1914. B. K., female, 14 months, weight 19 pounds, diarrhea and colic for 3 days, green slimy stools, about 4 daily, no fever, no vomiting. Treatment: Casein-calcium milk 4 ounces, q. 4H., water *ad libitum,* increase 3 ounces daily up to 1 liter per day. July 27th. Child better, stools once daily, yellow and hard at times. Weight 19 pounds.

CASE 3. July 22, 1914. L. S., male, 18 months, weight 17 pounds 2 ounces, diarrhea for 1 week, 5-6 green slimy movements daily, occasionally watery and blood-streaked, tenesmus. Treatment: Casein-calcium milk 5 ounces, q. 4H., increase 3 ounces daily for 2 days. July 29th. Stools once daily, yellow, no tenesmus, no blood. Weight 17 pounds 2 ounces.

CASE 4. August 10, 1914. D. E., male, 10 months, weight 21 pounds 10 ounces, diarrhea on and off for 3 weeks, 10 foul-smelling slimy stools daily. Had usual method of treatment without improvement. Treatment: Casein-calcium milk 4 ounces, q. 4H., water *ad libitum,* increase 2 ounces daily. August 28th. Stools yellow, semi-solid, 3 times daily. Weight 21 pounds 10 ounces.

CASE 5. August 15, 1914. S. K., male, 12 months, weight 18 pounds 6 ounces, diarrhea for 3 days, 5 yellowish tinged with green slimy movements daily, no vomiting, no fever. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 3 ounces daily. August 18th. Stools yellow, semi-solid, once daily. Weight 18 pounds 6 ounces.

CASE 6. August 6, 1914. M. K., male, 2½ years, weight 26 pounds, diarrhea for 3 days, 6 green slimy stools daily, blood-streaked once, no fever, no vomiting. Treatment: Casein-calcium milk 5 ounces, q. 4H., increase up to a liter gradually in 48 hours. August 17th. Stools once daily, yellow for past 2 days. Weight 26 pounds.

CASE 7. August 20, 1914. H. G., male, 15 months, weight 21 pounds 1 ounce, diarrhea on and off for 2 months, 3-5 greenish watery, occasionally slimy movements daily, no fever, no vomiting. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 3 ounces daily up to 1 liter per day. August 22d. Bowels moved 2 times yesterday, once to-day, yellow and semi-solid. Weight 21 pounds 1 ounce.

Case 8. August 24, 1914. D. L., female, 18 months, weight 20 pounds, diarrhea for 1 week, 5-7 greenish watery movements daily, no fever, no vomiting. Treatment: Casein-calcium milk 4 ounces, q. 4H., water *ad libitum,* increase food 2 ounces daily up to 1 liter per day. August 31st. Stools yellow, 2 times daily. Weight 20 pounds.

Case 9. August 25, 1914. A. W., male, 2 years, weight 25 pounds, diarrhea for 3 days, stools blood-streaked, slimy, 5 times daily, temperature 101°. Treatment: Casein-calcium milk 5 ounces, q. 4H., increase 4 ounces daily. August 27th. Stools yellow, 2 times daily, no blood, does not seem to take the food well; he desires other things to eat. Weight 25 pounds.

Case 10. August 28, 1914. F. G., female, 10 months, weight 18 pounds 10 ounces, diarrhea for 1 week, 8-9 green watery movements daily, cries a good deal, no vomiting, temperature 99.6°. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily. August 31st. Stools 3 times daily, yellow, semi-solid, child more restful. Weight 18 pounds 10 ounces.

Case 11. September 8, 1914. S. S., female, 11 months, weight 19 pounds 6 ounces, diarrhea for 4 days, 5-6 greenish watery movements daily, no vomiting, temperature 100°. Treatment: Casein-calcium milk 3 ounces, q. 4H., increase 2 ounces daily for 3 days. September 12th. Stools yellow and soft, 2 times daily. Weight 19 pounds 6 ounces.

Case 12. September 8, 1914. G. M., male, 19 months, weight 19 pounds 2 ounces, diarrhea for 3 days, 4-5 green curdy movements daily, vomited once, had some fever. Treatment: Casein-calcium milk 5 ounces, q. 4H., increase 3 ounces daily. September 10th. Had 2 yellow movements to-day. Weight 19 pounds 2 ounces.

CASES PRESENTING THEMSELVES ONLY ONCE FOR TREATMENT BUT FOLLOWED UP BY THE DISTRICT NURSE.

Case 1. July 20, 1914. J. S., male, 15 months, weight 20 pounds, diarrhea for 2 weeks, 5-6 green, occasionally brownish stools daily, temperature 100°. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 3 ounces daily. District nurse reports child perfectly well. Stools 2 times daily. Took food 1 week.

Case 2. July 25, 1914. S. B., female, 17 months, weight 20 pounds, diarrhea for 1 week, no fever, no vomiting, 5-6 watery stools daily. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 3 ounces daily. August 22d. District nurse reports child well, bowels move 2 times daily, normal in color and consistency.

Case 3. July 25, 1914. S. B., female, 2 years, weight 26 pounds, diarrhea for 3 days, 3-4 greenish watery movements daily, loss of appetite, no fever, no vomiting. Treatment: Casein-calcium milk 5 ounces, q. 4H., after 2 days increase to 8 ounces, q. 4H. August 22d. District nurse reports child well, gave food for 5 days. Stools yellow, 1 or 2 times daily.

Case 4. July 26, 1914. S. B., male, 15 months, weight 21 pounds 6 ounces, diarrhea for 5 days, restless, bowels move 5-8 times daily, green and slimy, sometimes yellow and watery, temperature 100°. Treatment: Casein-calcium milk 4 ounces, q. 4H., for 24 hours, then increase 3 ounces daily. August 31st. District nurse reports child doing very well, stools yellow, semi-solid, 2 times daily.

Case 5. August 1, 1914. S. K., male, 20 months, weight 22 pounds 2 ounces, diarrhea for 3 days, no vomiting, no fever, 5 green slimy stools daily. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 4 ounces daily up to 1 liter per day. August 22d. District nurse reports child well for 2 weeks, bowels move once daily, occasionally costive.

Case 6. August 3, 1914. I. H., female, 2½ years, weight 27 pounds 5 ounces, diarrhea for 6 days, 4-5 watery movements daily, temperature 100°, no vomiting. Treatment: Casein-calcium milk 5 ounces, q. 4H., for 24 hours, then 8 ounces and water *ad libitum.* August 14th. District nurse reports child perfectly well after taking food for three days. Took food for 5 days. Stools yellow.

Case 7. August 10, 1914. R. G., female, 13 months, weight 16 pounds 10 ounces, diarrhea for 4 days, 3-5 green slimy stools daily, no vomiting, temperature 101.4°. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 2 ounces daily. September 2d. District nurse reports child took food up to 3 days ago and is well. Stools yellow.

Case 8. August 10, 1914. F. S., male, 2 years, weight 23 pounds 3 ounces, diarrhea for 1 week, stools green and slimy, 4-5 times daily, restlessness, temperature 100.4°, no vomiting. Treatment: Casein-calcium milk 5 ounces, increase to 8 ounces, q. 4H., in 48 hours. September 2d. District nurse reports child well, took food 2 weeks. Stools 2-3 daily, yellow.

Case 9. August 13, 1914. F. N., female, 8 months, weight 18 pounds 5 ounces, diarrhea for 1 week, 6-7 green slimy movements daily, vomited several times, cries a great deal and is feverish. Treatment: Casein-calcium milk 3 ounces, q. 4H., until vomiting has ceased, then 4 ounces, q. 4H., increasing 2 ounces daily. August 22d. District nurse reports child well, vomiting has ceased, bowels normal color, move twice daily.

Case 10. August 14, 1914. S. R., female, 5 months, weight 15 pounds, 2 ounces, diarrhea for 4 days, stools green and slimy, 5 times daily, no vomiting, temperature 100°. Treatment: Casein-calcium milk 2½ ounces, q. 4H., increase 2 ounces daily up to 6 ounces, q. 4H. September 2d. District nurse reports child well, stools twice daily, has increased milk, added cereal.

Case 11. August 18, 1914. J. S., male, 2 years, weight 23 pounds, diarrhea and vomiting for 1 week, no fever, stools 4 times daily, green and watery. Treatment: Casein-calcium milk 5 ounces, q. 4H., water *ad libitum,* increase food 3 ounces daily. September 10th. District nurse reports child's stools yellow, 2 times daily, has been on regular diet for past 3 days.

Case 12. August 20, 1914. F. B., female, 15 months, weight 17 pounds, diarrhea for 3 days, stools green and slimy, 4-5 times daily, some fever, no vomiting, is breast-fed. Treatment: Casein-calcium milk 5 ounces, q. 4H., alternate with breast, increase food to 8 ounces gradually, q. 4H. Breast B. I. D. September 10th. District nurse reports child very much better, mother has weaned baby. Stools yellow, twice daily.

Case 13. August 25, 1914. Female, 8 months, weight 15 pounds 11 ounces, diarrhea for 3 days, 12 greenish watery movements daily, no vomiting, slight fever. Treatment: Casein-calcium milk 4 ounces, q. 4H., alternate with breast, increase 2 ounces daily, water *ad libitum.* September 10th. District nurse reports child well, took food for 5 days, movements yellowish and well-formed, 2 times daily, occasionally 3 times.

CASE 14. August 26, 1914. L. W., male, 18 months, weight 22 pounds, 5 ounces, diarrheal stools for 4 days, 5-6 green, slimy stools daily. A good many curds and other undigested particles of food, slight fever, no vomiting. Treatment: Casein-calcium milk 4 ounces, q. 4H., increase 3 ounces daily. September 2d. District nurse reports child well, bowels move once or twice daily, yellow. Took food 5 days.

CASE 15. September 1, 1914. J. B., male, 19 months, weight 23 pounds, 6 ounces, diarrheal stools for 4 days, 4-5 blackish watery movements daily, abdominal pain, slightly feverish. Treatment: Casein-calcium milk 5 ounces, q. 4H., increase 3 ounces daily. September 10th. District nurse reports child well for 1 week. Took food 5 days. Stools yellow, twice daily.

CASE 16. September 1, 1914. M. P., male, weight 16 pounds 11 ounces, diarrhea for 10 days, about 10 green, slimy movements daily, feverish at times. Breast-fed. Treatment: Casein-calcium milk 3 ounces, q. 4H., alternate with breast feeding, increase food 2 ounces daily. September 10th. District nurse reports child well for several days, is still taking the food, bowels move once daily, yellow in color.

CASE 17. September 2, 1914. B. P., male, 8 months, weight 21 pounds 5 ounces, diarrhea for 2 weeks, has 5-6 green watery movements daily, vomited 3 times, has slight fever. Treatment: Casein-calcium milk 3 ounces, q. 4H., increase 2 ounces daily when vomiting ceases. September 11th. District nurse reports child well, stools yellow, food still given, bowels move once daily.

I take this opportunity to express my appreciation and thanks to Drs. Himmelstein and Silverberg for their assistance rendered in recording and following these cases.

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SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Held October 8, 1914.

WILLIAM P. NORTHRUP, M.D., CHAIRMAN.

INFANTILE SCURVY: THE BLOOD, THE BLOOD VESSELS AND THE DIET.

DR. ALFRED F. HESS presented this paper, in which he related the results of a study in scurvy, the observations having been made at the Hebrew Orphan Asylum and the research work carried out in the Research Laboratory of the Department of Health. Attention was especially directed to the study of the coagulability of the blood with the object of ascertaining whether there was any marked change in this particular and whether a disturbance of this function could account for the various hemorrhagic symptoms of scurvy. In this series of cases they had the clinical data covering a long period before the development of the disease and they had been able to follow the infants for many months following their recovery. A number of these cases developed in the course of an attempt to do away with the giving of orange juice. In no case was the blood test made from blood obtained from the prick of the finger or the lobe of an ear, since these methods might introduce the disturbing factor of the thrombo-plastic substance of the tissue juices and this did not yield an accurate estimate of the coagulability of the blood itself. The coagulation tests were carried out after the method of Howell, which was by the addition of five drops of plasma to each of five small test tubes. To these tubes increasing amounts of ½ per cent. calcium chlorid made up in normal salt solution were added. The time was then noted when the plasma in the various tubes was clotted. After describing his method for testing the resistance of the capillaries and affirming his belief that it was to this lack of resistance that the petechiæ so characteristic of scurvy were due, he noted that these petechiæ were found in the mucous membrane of the hard and soft palate and in several instances in the palpebral conjunctiva. The blood in the urine might probably be considered as evidence of petechiæ into the internal organs. In postmortem examinations small hemorrhages had been found in the pleura, peritoneum, pericardium. Edema was also typical of an increased permeability of the vessels. A comparison of scurvy and hemophilia brought out a striking contrast. In hemophilia petechial spots were not found scattered over the surface of the body, nor was edema a symptom of the disease. On applying the capillary resistance test it was found that petechiæ were not induced by this increased vascular pressure. In other words, in hemophilia the vessels seemed to be normal. In scurvy the hemorrhages were usually minute and numerous; in hemophilia they were few and extensive. A point at times of value from a diagnostic point was that in scurvy a little sharp rubbing of the gums frequently produced slight hemorrhages. According to their experience the infectious diseases did not play an essential rôle in the production of scurvy. Dr. Hess summarized his study as follows:—

Infantile scurvy was a disorder characterized clinically by hemorrhage; for example, the classical bleeding into the gums and the subperiosteal hemorrhages of the long bones. A study of the cause of this bleeding, which must include a consideration of the clotting power of the blood, formed the nucleus of this investigation. For the coagulation tests blood was aspirated directly from the blood vessels and oxylated. This plasma showed a slight diminution in clotting power. The nature of this defect was not ascertained; however, it did not seem to be the result of an insufficiency of calcium, nor was the antithrombin increased. Small amounts of blood were also obtained by puncture of the finger. Examinations of this blood revealed a normal number of blood platelets. In other respects the picture was that of a simple secondary anemia, excepting that the hemoglobin was diminished out of proportion to the red blood cells. A marked regeneration of these cells during convalescence, leading to a polycythemia, was also noticed. These various departures from the norm were insufficient to account for the hemorrhages associated with the disease. The integrity of the blood vessels was therefore investigated by means of a device which might be termed a "capillary resistance test." This test consisted in subjecting blood vessels and capillaries of the arm to increased intravascular pressure, by means of an ordinary blood pressure band, and of observing whether this strain resulted in minute leakage of blood through the vessels—the appearance of petechial hemorrhages into the skin. The vessels of normal infants were found to withstand, without apparent disturbance, 90° of pressure for three minutes, whereas the vessels of infants suffering from scurvy gave away under this pressure. This test was not specific for scurvy, but was a method of demonstrating a weakness of the vessel walls, whatsoever might be its cause. In the course of an exceptional opportunity to observe scurvy in its incipiency, numerous petechial hemorrhages of the skin or mucous membrane were frequently noted as one of the earliest signs of the disease; no sign, however, should be regarded as preëminently the primary symptom of scurvy. It was generally recognized that scurvy had not only an exciting cause, but a predisposing one. The well-known "exudative diathesis" of Czerny was found definitely to predispose to the development of scurvy. Whether there were other predisposing factors remained to be determined. Several cases of scurvy developed in infants who were being fed on milk which was pasteurized to 145°F. for thirty minutes. They were cured by receiving fruit juices or raw milk. Orange juice was found not to lose its efficiency as the result of being boiled for ten minutes. The juice of the peel was successfully substituted as an antiscorbutic for the juice of the orange. Potato proved to be an excellent antiscorbutic. It was suggested that it be added to pasteurized milk as potato water instead of the barley water which was now commonly used as a diluent. In this way the necessity of giving orange juice would be obviated. Cod liver oil or olive oil, although given for weeks, did not prevent the development of scurvy.

Dr. William P. Northrup said he used to think it very queer that a family living out of town and having a Jersey cow on the place sent to town for proprietary food for the baby. This resulted in a case of scurvy. In his experience it seemed that subjecting milk to hard boiling was a factor in the production of scurvy. There was no scurvy if the child had the witching drop of orange juice. There were three conditions in which the pediatrician could do miracles—one was with orange juice in scurvy, another was thymus for cretinism and the third was intubation for diphtheria of the larynx. Dr. Northrup asked if there was a possibility that infection might play a part in the production of scurvy. Was there any such an element?

Dr. Sidney V. Haas said he wished to express his pleasure in hearing this interesting paper. There were a few points, however, on which he disagreed with Dr. Hess. One of these was that the "exudative diathesis" was an important etiologic factor in scurvy. In hospital and dispensary practice from 15 to 20 per cent. of all cases had the "exudative diathesis," although there was no disease rarer among this class of patients than scorbutus. In the days before they had certified milk, sterilized and pasteurized milk were used and very little raw milk, and even then there were few more cases of scorbutus than at the present time among these patients. The observations upon which the paper was based were made at an infant asylum and it was well known that where either infants or adults were collected in large numbers this disease was apt to be more prevalent. It was interesting to know how early in life this disease had been observed. This was a surprise. At the infant asylum they had the experience that after cutting out orange juice with 200 children, 65 of the number suffered from gingivitis or stomatitis. With the return to orange juice the cases all cleared up and within two weeks they had all recovered, although they had failed to respond to the thorough dental and oral treatment which was instituted.

Dr. J. Finley Bell, Englewood, N. J., said he had had a case of scurvy about three months ago which had been fed on Borden's nine-cent milk and which was cured by orange juice. It was claimed that this milk was not heated twice. The child recovered after about three weeks' treatment.

Dr. William P. Northrup related an experience which he had in trying to discuss this subject with Professor Variot, of Paris, of the Belleville Clinic. The professor could not understand English very well, while he himself could not speak much French. He had tried to relate an instance of two infants nursed at the same breast—one was a nursling and the other the mother's own child. The nursling developed scurvy, while the mother's child was fat and healthy. He had had great difficulty in making Professor Variot understand. The phenomena of scurvy were so distinct, yet so difficult to explain; so easily cured, and yet the most extraordinary which the pediatrician saw.

Dr Northrup stated that he had reported the first 11 cases occurring in American practice to the American Pediatric Society. He had seen the first case at the Foundling Hospital, and a pathologist had diagnosed it as a syphilitic hemorrhagic periostitis. Dr. Van Santvoort said it reminded him of a case in which the child had eaten chalk, sand and other articles, and at autopsy they concluded that the child had scurvy; he did the same. One found cases of scurvy in well-groomed families, where the greatest care was taken of the child's diet. These children, too, recovered on orange juice.

Dr. A. C. Wallin made reference to an article which he had written on the subject of scurvy which appeared in *Pediatrics,* August, 1914, in which he gave evidence confirmatory of the theory that scurvy was an acquired disease, with a hemorrhagic diathesis, from improper feeding, causing alkalinity, and that most cases had symptoms of indigestion of an alkaline nature. He stated that he had seen 4 cases of scurvy in breast-fed infants within the past nine months, and that he had attributed them to the alkalinity of the mother's milk. The children were entirely breast-fed excepting one, which was partly fed and partly nursed. They ranged in age from four to eight months.

Dr. William P. Northrup said that after a free discussion of scurvy he once asked Dr. Ripley whether he had not in his vast experience run across similar cases. Dr. Ripley, by the way, was an old friend of Dr. James O'Dwyer, and was sometimes called a specialist in all lines, so well informed was he. Dr. Ripley said he had seen such cases, had called them sometimes acute rickets, sometimes syphilitic osteotitis, treated them with citrate of potash and mercury, and after a time cured them.

Dr. Northrup referred to the last case of scurvy which he had seen and stated that the child had developed the disease on a malt-soup diet. He concluded that there were many different foods that might cause this condition; that it was the unvaried monotony on various foods that might produce it.

Dr. Alfred F. Hess (closing) said that he would endeavor to recall all the questions that had been asked and hoped that he would be reminded of any that he might forget.

In regard to infection as a source of scurvy, Dr. Hess said he had read what Dr. Caille had written in the report of the American Pediatric Society. He had observed the condition characterized by some leukocytosis, and slight fever, what the Germans called Barlow's fever. The fever was very slight and there was no epidemic. It was difficult to picture an infectious disease being controlled at will by the use of orange juice.

They had considered making tests of the alkalinity of the blood, but such tests seemed so uncertain that they had not been done; they did not seem to promise enough. He felt sure that with the pear juice it was not the alkalinity that caused the trouble, but why use pear juice when orange juice was so good and no case of scurvy was known to have developed on it? They could also give the juice of the orange peel as he had described.

As to the question whether he had undertaken any animal experiments, he had not done so, as such experiments could not show more than that orange juice was a curative agent and that had been demonstrated on human beings.

He had observed that scurvy occurred more frequently in private practice where infants were most well-cared for. The institution in which he had made his observations was an excellent one, and this fact must be taken into consideration in connection wth the facts presented.

As to the mashed potato, they used one tablespoonful of mashed potato to one pint of water and this prevented the onset of scurvy.

Dr. Royal Storrs Haynes asked Dr. Hess whether he had observed purple gums before the eruption of teeth, and also whether, after the teeth had come, this phenomenon appeared first before or behind the teeth, the occurrence of the hemorrhage into the gums behind the teeth first being characteristic in Dr. Haynes' experience, and perhaps being due to the pressure of the tongue against the gum in that situation.

Dr. Alfred F. Hess replied to Dr. Haynes' question that he had never seen the purple gums unless the teeth were erupted or about to erupt. He had never seen them where there were no teeth coming through.

Dr. J. Finley Bell, Englewood, N. J., observed that there might be danger from the potato water, as there might be solanin in the water in which the potato was boiled.

Dr. Hess replied that if it were demonstrated that there was such a poison the water from the potato should not be used, but that they had never had any unpleasant results from its use.

Dr. William P. Northrup reiterated the belief that it was the deadly monotony of an insufficient diet that was responsible for this condition, and that any fruit juice or other change that broke up the monotony might be curative. He asked Dr. Hess whether in his study of the coagulability of the blood they had used any other drug beside calcium.

Dr. Hess replied that the only drug they had used was calcium and they had found that there was already enough of that in the blood.

Dr. William P. Northrup said the most puzzling thing was that infants nursed at the mother's breast could have scurvy. He cited the case of an infant in a well-to-do family, one having the most careful attention of a nurse, that developed scurvy.

Hemolytic Streptococcus and Puerperal Septicemia.—A bacteriologic study of 103 labor cases by W. J. Walton and L. S. Medalia (*Surgery, Gynecology and Obstetrics,* 1912, Vol. XV., p. 682) shows that both hemolytic and non-hemolytic streptococci are present in the parturient canal during pregnancy before any digital examination has been made. The presence of the hemolytic streptococci is the exception, not the rule. Non-hemolytic streptococci are twenty times as frequent as hemolytic in the secretions of the pregnant. Hemolytic streptococci are found in afebrile as well as febrile parturient cases, and the non-hemolytic are discovered in both types of cases. The frequency of positive findings postpartum of the non-hemolytic is far above that of the hemolytic type, being twice as many (17 to 9). Schott-Müller's blood-agar method is of practical value in detecting the hemolytic property of the streptococcus. The hemolytic property is a characteristic of one type of the streptococcus group. Hemolysis as applied to the streptococcus does not determine the question of virulence or avirulence of this organism. Other tests will have to be found to establish the virulence or avirulence of a given streptococcus. The routine bacteriologic examination early postpartum is practical and important from the standpoint of prophylaxis, diagnosis, prognosis and treatment. The clinical symptoms alone are not sufficient to establish a diagnosis of puerperal septicemia. The bacteriologic examination is necessary to definitely establish diagnosis. The finding of the streptococcus, hemolytic or non-hemolytic, in febrile or afebrile cases, would indicate prompt isolation of the case to prevent the spread of infection in maternity hospitals. We have to recognize "healthy carriers" and "unsuspected carriers" of puerperal infection.

THE PHILADELPHIA PEDIATRIC SOCIETY.

June 5, 1914.

W. N. Bradley, M.D., President.

HOSPITAL PROBLEMS.

Dr. David L. Edsall, of Boston, by invitation, discussed the "Relationship of the Medical Staff to the Administration."

Dr. W. S. Thayer, of Baltimore, by invitation, discussed the "Responsibilities of the Medical Staff."

Dr. R. C. Cabot, of Boston, by invitation, discussed "Hospital Social Service and its Possibilities."

There was no discussion of these papers.

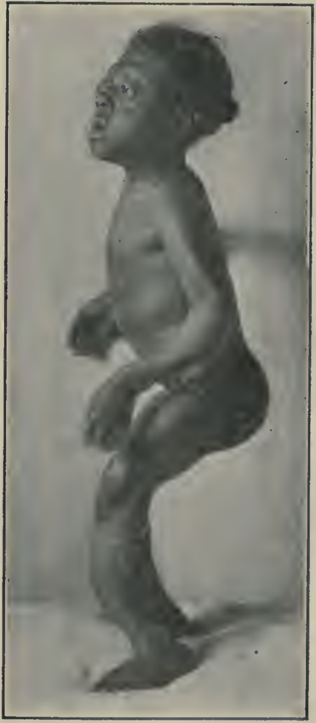
THE PHILADELPHIA PEDIATRIC SOCIETY.

October 13, 1914.

W. N. Bradley, M.D., President.

UNUSUAL RACHITIC DEFORMITIES.

Dr. Theodore Le Boutillier showed a colored girl, aged ten years, whose deformities were first noted when two years old. Now almost every bone in her body shows deformity. Her head is that of an ape; the eyes protrude markedly under her retreating forehead. Her height is much reduced, owing to bowing of long bones and spinal curvature. Mentality is about that of a child of six years.



MOLLUSCUM CONTAGIOSUM.

Dr. Frank Crozer Knowles presented this child, an infant with a dozen lesions on the lower portion of the face and neck. Contagiousness, differential diagnosis, pathology and treatment were briefly discussed.

INFANTILE SYPHILIS.

Dr. H. Lowenburg showed an infant of two months with a ham-colored rash, confined to extremities, intense anemia and enlarged spleen. The blood showed 30,000 leukocytes, with increase in small lymphocytes. Mother and infant gave positive Wassermann, while father and three other children were negative. The mother showed no evidence of syphilis. The etiology in this case remains a mystery. In spite of active treatment with neosalvarsan and iron, eye symptoms developed. Dr. Lowenburg wondered whether it would not be better to let such infants die than to treat them actively

PALATE DEFORMITY.

Dr. S. M. Hamill showed a baby with deformed palate and attacks of cyanosis.

Dr. J. K. Young thought that this case was one of complete cleft palate without hare lip.

Dr. Bradley asked Dr. Hamill to state how the baby was fed; if much difficulty was experienced in getting it to take the bottle, and if Dr. Hamill had had experience with special nipples for cleft palate?

Dr. Hamill answered that the baby takes the bottle well, with very little regurgitation.

DEFORMITY OF HANDS AND FEET.

Dr. Bradley showed an infant with deformed hands and feet.

Dr. J. T. Rugh said that this deformity was most unusual in type. He had observed a series of cases in one family in which four generations had shown club feet in every child, with club hands in some of them besides. Maternal impressions have been established anatomically by Fossetti, through the presence of nerve fibers in the cord and placenta. They are not only possible, but very probable in many cases.

Dr. Young considered this case remarkable and unique in that it exhibited both the absence of parts and fusion of those present. The absence of parts is best explained by the Ray theory:

that it is due to the arrest of the budding extremities; but the fusion is more difficult to explain and the association is unusual.

Dr. Bradley added that it was impossible to prove maternal mental impression in this case.

CRETINISM.

Dr. Joseph Fleitas showed a boy of eight years, with cretinism and possible hyperplasia of the hypophysis. The genitalia were very markedly developed. An X-ray of the skull showed enlargement of the sella turcica. Great improvement followed the administration of thyroid.

SPASTIC DIPLEGIA.

Dr. J. H. W. Rhein showed a family of four, with spastic diplegia. Two were boys, fourteen and ten years old, and the girl was eight. A younger sister, aged five, as yet shows only increased knee-jerks. Another sister died at fourteen, having had the disease ten years. Family history is absolutely negative. Symptoms began with spasticity in the legs, with the arms affected in about a year; followed by mental changes associated with speech disturbances. Sensory, sphincter and eye symptoms were absent. Wassermann reaction was negative in all, as in the father.

Dr. A. A. Eschner said that Dr. Rhein's explanation of the cases was most reasonable. Their familial character, as well as the time and mode of their development, would seem to point strongly to some defect in evolution, in consequence of which, instead of normal growth of tissue and normal unfolding of function, there was a cessation of these processes, if not a retrogression, a condition comprised in the term abiogenesis or abiotrophy. There can be no doubt of their organic nature.

Dr. Young said that there was no history of hereditary disease or consanguinity. Wassermann reactions in all children and both parents were negative. No cause for the conditions has been found.

Dr. Bradley referred to a somewhat similar case which he had observed several years ago. There were five children in this family, and the second, third and fourth were affected. They lived to early adult life, and died of tuberculosis. The first and fifth children were normal and remained so throughout life.

OSTEOSARCOMA OF FEMUR.

Dr. E. E. Graham reported this case.

Dr. W. F. Manges demonstrated the X-ray plates of this case. He also referred to two similar cases treated by the X-rays and Coley's fluid, one four and the other two years ago, with recovery. He advised similar treatment in this case.

DISLOCATION OF THE COCCYX.

Dr. Rugh showed this girl, aged fourteen years, who fell in May, 1913, while roller skating, striking her spine on the curb. Pain was most marked when rising after having been seated a while. Rectal examination showed the coccyx dislocated forward on the sacrum. Dr. H. A. Wilson operated in September, 1914, uncovering the sacrococcygeal articulation, removing a posterior wedge-shaped piece, and placing a mattrass suture of silk drawing the two cut surfaces together, thus tilting the coccyx downward and backward. Patient was kept in bed several weeks. Recovery was uneventful. This operation is preferable to removal of the coccyx.

Dr. Alfred Hand, Jr., said that it was apparently very easy to overlook such a condition. She was kept in bed with acute articular rheumatism and endocarditis for six weeks. While she made no mention of the coccygeal condition at this time, she had complained of severe pain in the lower part of the abdomen one day during her stay in bed.

CONGENITAL CLUB FOOT.

Dr. Young showed this child, with congenital club foot cured by operation, to illustrate the fact of orthopedic treatment after operation. He insisted that it was quite as important to treat these cases as it was to perform the operation, and good results could only be obtained by combining both forms of treatment. The operation consisted of open division of the posterior tibial tendon and subcutaneous division of the anterior tibial, plantal fascia and tendo Achilles. The operation was performed at the time the child was twelve months old, about the time it began to walk. The deformity was corrected and held in cast for three weeks, the brace was then applied and massage treatments given, also active Swedish movements for one year, special attention being paid to the peroneal or weakened muscles. A night brace is also useful in holding the foot in position all night. In answer to Dr. Graham's question, Dr. Young added that the best time for this operation was about one year. Some surgeons operate before, but the tendons are so small that results are not always good. Braces may be applied before the baby is a year old.

CONGENITAL ELEVATION OF THE SCAPULA.

DR. J. H. JOPSON showed X-rays and photographs of 2 cases of Sprengel's deformity. One was a boy of two years, in whom the right shoulder was affected, the condition being associated with a practical absence of the latissimus dorsi muscle and the postaxillary fold. There was little limitation of motion and no operation was attempted. The other case, a girl, also had the right shoulder affected. The right scapula was 2¼ inches higher than the other, rotated upward and outward, the lower angle being drawn toward the spine and the vertebral border almost in contact with the spine. The vertical diameter of the right scapula was smaller than the left. Abduction of the right arm was limited; the arm could not be raised above the shoulder. The left lower extremity was more than an inch longer than the right. At operation a supernumerary bone was found to articulate with the vertebral border of the scapula at the junction of the middle and lower thirds, a real joint lined with cartilage being present. The other end of this metacarpal-shaped bone was fused with the lamina of the seventh cervical vertebra. This bone was excised, the muscles attached to the upper end of the scapula divided and sutured at a higher level. Improvement in abduction and elevation was prompt, almost to normal, with marked lessening of deformity. Dr. Jopson reviewed the theories of the causation of this congenital malformation.

DR. W. E. LEE showed a girl who had come to the Children's Hospital for Colle's fracture. Her head was held in peculiar position, rigid, without flexion or extension, and but a few degrees of rotation. Both shoulders were elevated and fixed. The posture was typical of tuberculosis of the cervical vertebræ. Just below the very prominent seventh cervical vertebra was another bony prominence, attached to the inner edge of the left scapula at the level of the spine. This limited any movement of the left scapula. The left humerus could not be raised to more than an angle of

90° with the body. X-ray showed this bony prominence to articulate with the edge of the scapula and spines of the upper dorsal vertebræ. The process was exposed by a boomerang excision. Starting along the upper edge of the scapula it passed around the bony process and ended near the angle of the scapula. Attached fibers of the latissimus dorsi were separated and a distinct articulation was exposed between the inner end and the edge of the scapula. Further isolation of the process showed the inner end attached to the arching processes of the first dorsal vertebra. This process was apparently an elongation of the spine of the first dorsal vertebra which articulated with the edge of the scapula. The process was disarticulated at its outer end and the spine severed with bone-cutting forceps at its origin from the arching processes of the first dorsal vertebra.

Dr. E. B. Hodge spoke of the comparative frequency of this condition and the success of operative relief.

Dr. Jopson believed that, although it might be an intrauterine malformation, it was more probably reversion to a primitive type, the presence of the supernumerary bone in a large proportion of cases indicating its atavistic origin.

PULMONARY TUBERCULOSIS IN CHILDHOOD.—It used to be taught that up to puberty or thereabouts the average child did not suffer from the adolescent or adult types of pulmonary phthisis. We were to fear chiefly tuberculosis of the bronchial glands, acute miliary tubercle, etc., and especially the meningeal location. Today Rach (*Münch. Med. Woch.*, March 24, 1914), an assistant of von Pirquet, shows that such teachings are largely antiquated. Children and even nurslings present lesions which do not differ essentially from those of much older subjects. We are now able to isolate six types of pulmonary tuberculosis in childhood: I. Gihon's primary focus, which may appear anywhere in the lung. II. The intumescent tuberculosis of the bronchial glands. III. The intrapulmonal hilus tuberculosis. IV. Miliary tuberculosis. V. Nursling's phthisis, and, VI., apex tuberculosis. This classification is largely the result of studying radiographs. Nursling's phthisis includes cavitary lesions and caseous pneumonia. Apex tuberculosis may begin as early as the seventh year.—*Medical Record.*

CURRENT LITERATURE

Abstracts in this Number by
Dr. Charles E. Farr. Dr. Mark S. Reuben.
Dr. Harold R. Mixsell. Dr. J. Herbert Young.

MEDICINE.

Steinschneider, Dr. Emanuel: Pseudomembranous Colitis of Infants. (*Archiv. für Kinderhk.,* November, 1913.)

This condition was first described in adults by Nothnagel under the name of "colica mucosa." In infants this condition is not associated with colicky pains as it is in adults. The general condition of the infant is good; the appetite is not disturbed. Outside of the passing of these pseudomembranes there are no other intestinal symptoms present (no diarrhea and no obstipation). In all the cases there is usually an antecedent history of enteritis; 2 of the 3 cases reported had chronic skin eruptions ("lichen urticatus and ekzem").

Mark S. Reuben.

Mitchell, A. Philip: A Bacteriological Study of Tuberculosis of the Lymph Glands in Children. (*Edinburgh Medical Journal,* September, 1914, p. 209.)

Mitchell has investigated, at the Royal Hospital for Sick Children, Edinburgh, the relative frequency of the bovine and human types of tubercle bacilli in tuberculosis of lymph glands in children. In a series of 29 autopsies in children under twelve years of age, dying from all causes, cultures were isolated in 12 of the 29 cases. Eight cases yielded cultures of human tubercle bacilli, and 4 of the bovine type. Of the 4 bovine cases, 3 died from tuberculosis, the immediate cause of death being tuberculous meningitis. The other child died from intraperitoneal hemorrhage, the tuberculous lesions being found at autopsy. In all 4 cases bovine tubercle bacilli were isolated from the mesenteric glands, from the cervical glands in 1, the bronchial glands in 1, and the meninges in 1. In the cases in which human tubercle bacilli were found, in all but one the bronchial glands were the primary seat of disease. Human tubercle bacilli were isolated from the tonsils, cervical, axillary, bronchial and mesenteric glands.

A study of cervical glands removed at operation showed in

80 consecutive cases 71 instances (88 per cent.) of infection by the bovine bacillus, and 9 instances (12 per cent.) of infection by the human tubercle bacillus. The cases were those of children twelve years of age and under. The maximum incidence occurred during the second year. Of children two years and under, 84 per cent. had been fed with unsterilized cow's milk. Out of 8 cases of abdominal tuberculosis, 7 proved to be of bovine origin and 1 of human origin. All the children were under twelve years of age and had been fed on raw milk. In the human infection the father had chronic pulmonary tuberculosis.

J. HERBERT YOUNG.

SURGERY.

THOMAS, T. T.: OBSTETRICAL PARALYSIS. (*New York Medical Journal,* July 11, 1914.)

Thomas is one of those who cling to the belief that obstetrical paralysis is due not to the injury of the brachial plexus, as is generally believed, but to a posterior subluxation of the head of the humerus on the glenoid. His chief arguments are that the electrical reactions, as well as the tests for sensation, are normal in these cases, which would not be true were the fibers of the plexus torn by the trauma, and that treatment of the posterior subluxation results in cure in a large proportion of the cases.

CHARLES E. FARR.

CORVER, EDRED M.: FURTHER EXPERIENCES OF THE TREATMENT OF IMPERFECTLY DESCENDED TESTICLES. (*The American Journal of the Medical Sciences,* July, 1914, p. 51.)

The treatment suggested for the condition of imperfectly descended testicles may be summed up from the point of view of the patient's age, as the condition is a congenital one. At birth and up to the age of about five years watch the case to decide if the testicle is merely late in the descent or not. If a hernia is seen to be present, operate and conclude by doing an orchidoplasty. From seven to twenty years of age operate if a hernia is present or not. Do either an orchidoplasty, an orchidectomy, or an orchidocoelioplasty. Above twenty years of age do an orchidectomy. HAROLD R. MIXSELL.

BOOK REVIEW

Practical Pediatrics: A Modern Clinical Guide in the Diseases of Infants and Children for the Family Physician. By James H. McKee, M.D., Professor of Pediatrics in the Medical Department of Temple University; Visiting Pediatrician to the Philadelphia General Hospital, Garretson Hospital, and Samaritan Hospital, Philadelphia, and to the Bancroft School for Mentally Deficient Children at Haddonfield, N. J.; Formerly Professor of Pediatrics in the Woman's Medical College of Philadelphia, etc.; and William H. Wells, M.D., Assistant Professor of Obstetrics, Jefferson Medical College; Pediatrician to the Willings' Day Nursery; Assistant Obstetrician, Maternity Department, Jefferson Medical College Hospital; Fellow of the College of Physicians of Philadelphia; Formerly Adjunct Professor of Obstetrics and Diseases of Infants in the Philadelphia Polyclinic and College for Graduates in Medicine, etc., with an Appendix upon "Development and Its Anomalies," by John Madison Taylor, A.M., M.D., Associate Professor of Non-Pharmaceutic Therapeutics, Medical Department, Temple University, Philadelphia; Formerly Professor of Diseases of Children, Philadelphia Polyclinic and College for Graduates in Medicine, and of the Medico-Chirurgical College of Philadelphia; Fellow of the College of Physicians of Philadelphia; Corresponding Member of the Société Hygienique de France; Consulting Physician to the Schools for Feeble-minded Children at Elwyn, Pa., at Vineland, N. J., and at Haddonfield, N. J., etc. With 2 colored plates and 146 illustrations, including 238 figures, in two volumes. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street.

This most interesting book is, as its title indicates, a practical book on practical pediatrics and offers the very latest word not only in contemporary findings, but in the writers' experience on the subject of the conservation of infants and children, in and out of health. With this in mind the authors emphasize prevention of disease in the widest sense of the word, as well as the recognition and repair of abnormalities and disease after the onset. Developmental abnormalities demand early recognition owing to the effects they must induce upon organic integrity and growth of the organism. For this reason the appendix on "Development, Anomalies of Development, Conservation, Deformities of Infants and Children"; in other words, the child as a clinical problem, is of immense importance and comprises almost two hundred pages of well-written facts. Of the newer aids in diagnosis the chapter on "Blood-Pressure Studies in Early Life" appears for the first time in a book on pediatrics. Serum treatment, bacterins and tuberculin have been taken up in detail, while the physiological action of drugs is interpreted as far as possible. Diagnosis and treatment of deformities form an interesting chapter. Many of the illustrations are new and are featured by pointing out differentiations of typical conditions. The chapters dealing with Fundamental Differences between Child and Adult, Physical Examination, Infant Feeding, Coryza, Bronchitis, Pneumonia, Empyema, and Diseases of the Nervous System have been given special care. The book itself is well bound and comprises 1,181 pages, and as a reference book it is a valuable one for both pediatrist and general practitioner.

THE TREATMENT OF DIPHTHERIA BACILLUS CARRIERS WITH BOUILLON CULTURES OF STAPHYLOCOCCUS PYOGENES AUREUS.—J. D. Rolleston describes (*British Journal of Children's Diseases*, July, 1913) 10 chronic diphtheria bacillus carriers who were treated by spraying and swabbing the throat and nose with a bouillon culture of staphylococcus pyogenes aureus. In 6 faucial cases the findings were negative within two to seven days after starting the treatment. In the 2 nasal cases no result was obtained. The method should not be employed except late during convalescence. A mild form of sore throat was produced within a few days, and there was considerable malaise; the symptoms were of short duration. The culture is easily prepared and no injections are required, so that the method has advantages over the endotoxin treatment. The histories of the cases are described. There was a death in an infant of three months who had been admitted with nasal diphtheria and congenital syphilis. In this case the terminal bronchopneumonia developed nearly three weeks after the use of the spray.—*The Universal Medical Record.*

ARCHIVES OF PEDIATRICS

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EDITORIAL

"PEOPLE WHO LIVE IN GLASS HOUSES."

All over our land at this Christmas season, when through the immemorial years Christmas bells have rung out their "Peace on Earth, Good Will toward Men," and the holly and the mistletoe and the fir trees, brightly lighted and heavy with glittering ornaments, have betokened a spirit of love and kindly feeling; when stockings have been hung and fond parents stealthily have brought out presents long since hidden away from the children's eyes; when candle-bearing waits, their forms dark against the white carpet of snow, have sung their carols to celebrate the Glorious Birth—at this kindly, human time we, in America, are glad that we are, indeed, here. We have no ruined cities; in our cathedrals no gaunt spectre of havoc chills the Christmas praise; war has not ravaged from us our young men and cast a leaden burden of unutterable melancholy upon all our hearts. We dwell in peace, we deprecate war. Our press, our pulpit, our "sidewalk parliaments" cry out at the ruthless destruction, the keen precise, terrible slaughter in no uncertain tones of condemnation. The spectacle of Belgium destroyed and her children left homeless, fatherless and destitute, stirs us to the depths of our being and however we view the awful conflict which is now going on, we are touched by the suffering and the privation of the little children.

Yet in our land of peace, of neutrality, of freedom from the bitter weight of terror and grief, we are taking away from many little children their youth, their strength, their future! The great war of industrial greed keeps children of six or seven at spinning machines in Southern cotton mills, or in canneries in Northern states which will not or can not enforce their laws. Six states of the Union have no fourteen-year limit for the employment of children; six have no compulsory school attendance law and in fifteen states which have a fourteen-year law it is evaded and nullified by exemptions. An army of 100,000 children from ten to thirteen years of age were at work in non-agricultural occupations in 1910. How many children in war-stricken Belgium are there whose condition as regards danger to their moral and physical future is more serious than that which confronts these victims of our peaceful ravaging? There is an heroic uplift in Belgium's terrible experience, dreadful though it be. There is a glowing determination among the Belgian soldiers unique among the combatants. To the poor children who survive these days of famine and dire necessity will come some benefit to the soul. What of spiritual uplift can the employer of child labor here offer to compensate for the hours of toil which he takes from little ones whose bones and muscles are not ready for continuous application and whose right it is to play and to learn?

The fourth Sunday in January is to be observed as Child Labor Day in churches and schools throughout the land. Let it be observed with just as much sincerity and by just as many people as was the Day of Prayer for Peace a while ago! Particularly we hope it may make its appeal to the members of the legislatures of the various states where the National Child Labor Committee hopes to secure adequate child labor laws and to the members of Congress on whom it will rest to make the Palmer-Owen Bill a law. This bill requires a fourteen-year age limit in all factories, mills, canneries and workshops which make goods for interstate commerce, with an eight-hour day and no night work for children under sixteen years in these occupations, and a sixteen-year limit for mines and quarries.

And they, North, South, East, West, upon whom rests the responsibility for the presence of young children at work, as they look toward Europe's battlefields, as they pity Belgium or generously subscribe to Belgian relief, as they exclaim at the barbarity of it all, likening the Germans, who look after their children, to the hordes of Attila the Scourge—let them remember they *should not throw stones!*

THE SERUM TREATMENT OF PNEUMONIA.

To the practitioner whose use of serums in the treatment of pneumonia has been guided by publications of the pharmaceutical houses who have such serums to sell, the conclusions of the investigators of the hospital of the Rockefeller Institute, as detailed by Dr. Cole in his Frederick A. Packard Lecture,* will come as a rather unpleasant awakening. They have been happy to be able to inject a "polyvalent" serum and believed that thereby a passive immunity was conferred, or at least that an antagonist to the pneumococcus had entered the arena. Dr. Cole shows that such sera as have been developed must be given in large dosage and early in the disease to be at all effective. Further, as it may be impossible to determine what type of pneumococcus is causing the disease, specific treatment is made additionally difficult. For though the organisms of Types I. and II. will develop immune sera of considerable potency against pneumococci of their own groups, these sera are useless against organisms outside their own groups; while those of Type III. will not produce a serum capable of transferring passive immunity and each member of Type IV., which includes all the myriad strains which do not fall in the other types, is individual in its serum as though it constituted itself a type.

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* See page 927.

Thus to obtain a "polyvalent" serum in the true sense of the word is impossible. What is possible is to use a serum which contains antibodies against Types I. and II., to use it early and in large dosage. That will not affect cases of Type III. Cases of Type IV. more usually get well. For a scientific basis for serum treatment of pneumonia, however, a determination of type should be made and the appropriate serum given.

Researches, such as this summarized by Dr. Cole, show the value to medical progress of institutions equipped to follow out a line of investigation relentlessly to a logical conclusion; and emphasize what we all know—that clinical reports of cures are often worthless for drawing scientific conclusions, because the premises from which they are drawn have not been clearly demonstrated.

ORIGINAL COMMUNICATIONS

MEASLES: INCUBATION, INFECTIVITY, IMMUNITY, EARLY MANIFESTATIONS.*

BY CHARLES HERRMAN, M.D.,
Attending Pediatrist to the Lebanon Hospital, New York.

When I returned from Europe in 1898, I had the good fortune to assist Dr. Koplik at the Good Samaritan Dispensary. I naturally became interested in the buccal manifestations of measles at that time. Since then measles has been a hobby of mine and I have had ample opportunity to ride my hobby. As a medical inspector in the Department of Health of the City of New York I was able to study large numbers of patients in the tenements and to note the spread of the disease in public schools. In hospital, dispensary and private practice I have had an opportunity to study other phases of the subject. No other disease is more interesting or serves better for the study of the problems of incubation, infectivity and immunity. In susceptible individuals the infection takes place with such certainty, the disease follows after a definite period with almost mathematical precision, and the early manifestations are fairly uniform. In the course of years I have been able to gather a large amount of material, of which I shall now give a brief summary.

Incubation.—Strictly speaking, the period of incubation should be limited to the interval which elapses between the time of infection and the appearance of the first definite symptom, which is always a rise in temperature. This can be determined *very accurately*. The same cannot be said of the appearance of Koplik's spots, the catarrh and the eruption. In Hektoen inoculation experiments the blood of a measles patient taken within thirty hours after the appearance of the eruption was injected into two adults. At the end of seven to eight days the initial rise of temperature occurred. Anderson and Goldberger injected the blood of patients with measles taken from twenty-four hours before to thirty-six hours after the appearance of the eruption into monkeys and obtained the initial rise of temperature in most cases in from ten to eleven days.

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* Read before the Medical Society of the Borough of the Bronx, October 14, 1914.

In my own experience I have been able to collect notes on 50 patients in whom I was able to determine within an hour or two the time of infection. Such children were infected either when at home by another member of the family or in the hospital ward by a patient who had been admitted while in the incubation period. In the first instance the primary case would go to bed without any evidence of catarrh, would sleep apart from the other child and come in contact with it for an hour or two the following morning while in the beginning of the catarrhal stage. The first would then be examined, a rise in temperature and the presence of Koplik's spots observed and the child immediately isolated. In the hospital ward the time of infection could be even more accurately determined because the patients were under continuous and careful observation and could be more promptly isolated, so that the time of exposure was extremely short. In the following table (Table I.) I have given the number of days which elapsed from the time of exposure to infection to the appearance of the fever, Koplik's spots, catarrh and the eruption in the series of 50 cases. I should like to emphasize again that, although the initial rise of temperature can be accurately ascertained, the exact time of the appearance of a few Koplik's spots, the catarrh and eruption are determined with great difficulty. The eruption does not always appear first behind the ears, or in the face, but on the upper part of the back, and without a careful search might easily be overlooked. In some cases the eruption is seen, so to speak, beneath the skin several hours before it comes to the surface.

TABLE I.

DAY	7	8	9	10	11	12	13	14	15	16
Fever	2	4	8	14	11	8	2	1		
Percent	4	8	16	28	22	16	4	2		
K.Spots			4	13	13	8	9	1	1	1
Percent			8	26	26	16	18	2	2	2
Catarrh		2	3	12	15	11	5	2		
Percent		4	6	24	30	22	10	4		
Eruption				1	8	14	12	9	4	2
Percent				2	16	28	24	18	8	4

Number of days elapsing from time of exposure to measles and the appearance of Koplik's spots, catarrh, fever and eruption, also per cent. of occurrence in fifty cases.

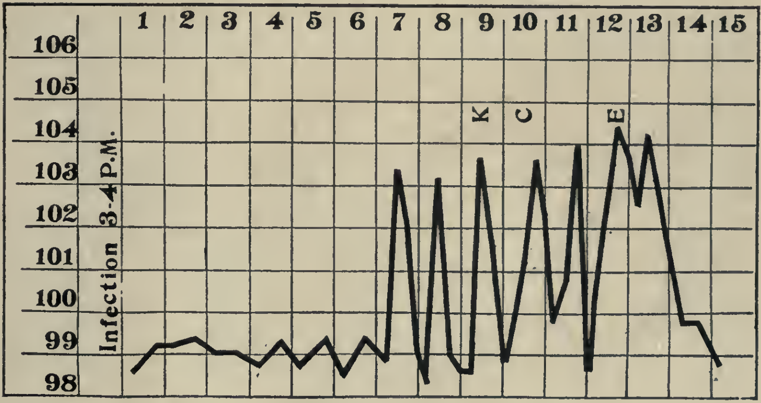

Fig. 2. Chart of a case with short incubation period.

The figures 2, 3 and 4 show (2) a short incubation period of seven days, (3) a case in which the appearance of fever and Koplik's spots preceded the eruption by five days, (4) a distinct interval between the initial and the second rise of temperature, and a drop, by crisis, 6° in four hours. Using the term as defined, I have not seen an incubation period of less than seven days or more than fourteen days, and believe it possible that in some of the reported cases, with a longer period of incubation, the source of infection may have been difficult to determine, or some may have been cases of German measles. The time which elapses from the initial rise of temperature to the

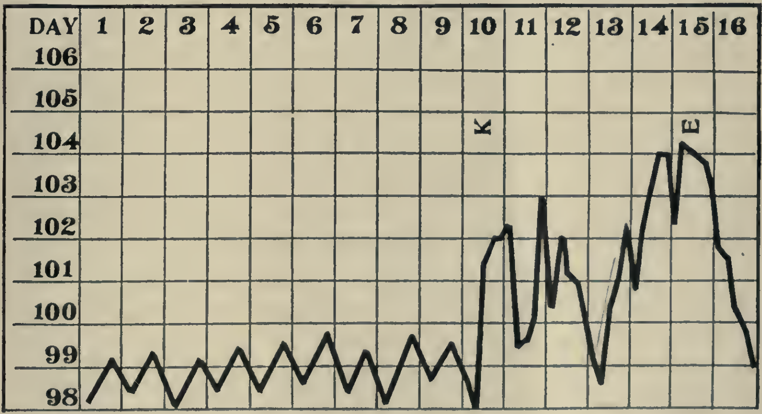

Fig. 3. Chart of case where the occurrence of Koplik's spots preceded eruption by five days.

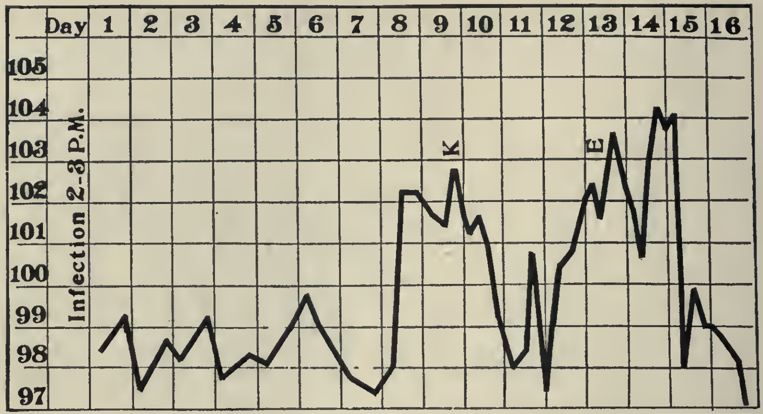

Fig. 4. Chart of case showing a distinct fall in the temperature between the occurrence of Koplik's spots and the appearance of the eruption; also a fall of the temperature by crisis.

appearance of the eruption varies from one to five days and is usually two or three days; the time from the appearance of Koplik's spots to the eruption from one to five days, usually one or two days. The following table shows the result in the series of 50 patients in whom the day of infection was definitely known:—

TABLE II.

Days between	0	1	2	3	4	5
Fever to eruption	0	6	19	15	8	2
Koplik's spots to eruption	3	19	20	5	2	1

Infectivity.—Hektoen, Anderson and Goldberger and others have demonstrated experimentally that the blood of patients with measles contains the infectious material and that human beings and monkeys can be infected by injection if the blood is taken not later than thirty-six hours after the eruption appears. Its infectivity is apparently greatest from twenty-four hours before to twenty-four hours after appearance of the exanthem. This agrees with my own clinical experience and I have stated for several years that *measles was contagious for only three or four days.* I believe that the disease is contagious from the beginning of the catarrhal symptoms to the fall in temperature, the latter usually corresponding to the time of the completion of the eruption. The blood is probably infectious from the initial rise in temperature to its fall, in uncomplicated cases. I have had a number of children who were exposed to infection only for a short time during the catarrhal stage, twenty-four hours or more before the eruption appeared, and if not protected by a previous attack they have contracted the disease. On the other hand, I have had a number who were exposed to patients just after the fall in temperature, that is, after the completion of the eruption, and, although they came in intimate contact, they did not contract the disease. The secretions of the nose and mouth in sneezing and coughing are the carriers of the infectious material. The scales of the skin play no part. I believe that an isolation of two weeks or more, as is usually recommended, is unnecessary—five days at most are sufficient. I have on several occasions admitted children with a fading measles eruption (who had a complication or some other disease) to the hospital ward, and have not had any infection of the other children in the ward. Another observation which bears out the assumption of the non-infectivity after the completion of the eruption and the fall of temperature is the fact that in families in which there are a number of children an interval of from ten to fourteen days always elapses between the first, second and third series. I could cite from my notes a number of such instances. If the disease was contagious for more than five days this interval would not occur with such regularity.

Immunity.—A small percentage of individuals are really immune. This is a real immunity and not due to failure of exposure. Of 100 consecutive children over five months who had not had the disease of which I have notes, 96 contracted it when they came in intimate contact with a case, usually another child of the same family and in the tenements; only 4 escaped. I have occasionally observed that a child who escaped the first contact was infected subsequently by a second, so that in all probability not more than 2 or 3 per cent. of all individuals enjoy this real immunity. In the experimental work of Anderson and Goldberger it was shown that monkeys that had passed through one attack were immune to subsequent infection. This corresponds to our clinical experience with human beings. An occasional rare exception takes nothing from the validity of this rule. I have records of a very large number of children who had had an attack of measles and who subsequently came in intimate contact with a case—such intimate contact as occurs in the children of one family, in the tenements, and, in many instances, even sleeping in the same bed with the patient. In not a single case did I see a second attack. Many of the reported cases of a second attack will not bear a careful analysis. Records of cases before 1896, when the pathognomonic buccal manifestation was described, must be excluded. In view of the great rarity of second attacks, I think we are justified in demanding that the Koplik's spots should have been observed in both attacks, for fever, catarrh and a morbilliform eruption are not sufficient. Some cases of German measles are indistinguishable from mild cases of measles on the basis of these symptoms alone and there are morbilliform eruptions which it is practically impossible to differentiate from the true measles eruption. A diagnosis of measles under five months of age is always doubtful, and if other susceptible children did not contract the disease by contact the diagnosis is still more doubtful.

Infants under five months are practically immune. This immunity I have frequently found to extend to the sixth or seventh months. In all, I have seen but 3 *undoubted* cases of measles under five months; the youngest was an infant twelve days old, whose mother had a beginning measles eruption when the baby was born, and probably infected it on the day of birth. This immunity of young infants is found in the artificially-fed as well as in the breast-fed, and is not limited to the first-born. I have notes of 40 consecutive cases of infants under five months who did not contract the disease, although they came in very intimate contact with patients, such contact as occurs in the tenements, often lying in the same bed. Of these, 8 were artificially and 32 breast-fed. This also represents the ratio of artificial as against breast feeding at that age, so that there is apparently no difference in susceptibility. If this immunity is conveyed to the infant from the mother (which is doubtful) it must be transmitted through the placental circulation, not through the breast milk. Besides, if it was through the breast milk, it is difficult to understand why it should last only five months.

Early Manifestations:—

(1) Fever.
(2) Decrease in weight.
(3) Changes in the blood picture.
(4) Enlargement of the lymph nodes.
(5) Oral manifestations.
(6) Conjunctival manifestations.

(1) A rise of temperature is the first definite symptom. There is nothing characteristic in the curve, but an intermission of

twenty-four hours after the initial rise is very suggestive. If the patient is seen in the period of remission, the Koplik's spots may be visible and may apparently be the first symptom, but if the patient is followed during the entire period of incubation, I believe the initial rise of temperature will always be found to be the earliest manifestation. This is what we should expect, as it probably represents the reaction of the organism to the first clash between the infectious material and the antibodies in the blood.

TABLE III.

Age	9m	9m	10m	11m	15m	17m	19m	2y	3y	17m
Wt. Infect	15-11	16-2	13-12	20-14	20-8	19-3	24-3	23-2	27-13	19-3
Wt. Invas.	15-7	15-14	13-15	20-12	19-15	18-6	23-12	23-8	26-14	18-
Loss ounces	4	4	+3	2	9	13	7	+6	15	19

Showing loss of weight in period of incubation of measles.

(2) The decrease in weight (Table III.) I have not found of great practical value. It averages only a few ounces and this might be caused by a number of slight derangements. There may be a slight increase during the first five days of the incubation period, so that all the loss occurs during the last five days. It must also be remembered that an infant should gain from 6 to 7 ounces in ten days, so that the real loss is greater than the figures would indicate.

(3) The daily examination of the blood during the period of incubation usually gives valuable information. Unfortunately, it is only possible in the hospital patients. During the period of incubation, about six days before the appearance of the eruption, there is a leukocytosis; later, during the invasion, a leukopenia, a distinct diminution in the percentage of eosinophiles and a relative and absolute diminution in the number of lymphocytes. I have recently had an opportunity of examining the blood in 3 cases during the period of incubation and invasion and found the changes as given above. I have also found the examination of distinct value in the diagnosis of a probable complication. After the fall in temperature corresponding to the completion of the eruption, there is an interval with no fever and a normal blood picture; with the presence of a complication the temperature again rises and a change takes place in the blood picture.

(4) In a large percentage of patients I have found the lymph nodes, including the epitrochlears, enlarged. However, this occurs so frequently in other diseases with which measles might be confused that it is not of much practical value.

(5) The oral manifestations.

The same exciting agent causes the changes in the mucous membranes and skin. The difference in the time of their occurrence and in their appearance is due to the difference in the blood supply and in the structures of the tissues involved. The greater the blood supply the earlier and more distinct the manifestations. For this reason they are observed earlier in the mucous membranes and in parts which are hyperemic. This may explain why Koplik's spots are seen most distinctly on the mucous membrane opposite the molar teeth, as at these points there is a slight hyperemia due to pressure. In accordance with this I have occasionally noted that in young infants of a year or less, who have no molars, the Koplik's spots are not distinct at these points. I have on several occasions noted the early appearance of the eruption on parts of the body which were hyperemic from a recent burn, and the action of a hot bath in hastening the appearance of the eruption is probably due to the same cause. The various manifestations on the mucous membrane of the mouth are caused by the same agent, but differ in appearance on account of the different structure of the parts. They may be conveniently divided into those on the palate, buccal membrane and gums.

The following is the description of the manifestations on the palatal and buccal mucous membrane as given by the Danish author, Flindt. I translate from the German of Jürgensen: "On the first day of the fever the throat is slightly reddened. On the second day the posterior portion of the palate and the tonsils present a fairly well-marked redness without any distinct swelling, the anterior portion of the palate and the pillars of the fauces present a less well-marked diffuse redness of varying intensity. In the evening of the same day the tonsils and the mucous membrane of the posterior portion of the soft palate present the same appearance as in the morning, but on the anterior portion of the soft palate, on the posterior portion of the hard palate, and on the otherwise normal colored mucous membrane an enanthem. This consists of round or more or less irregular bright-red spots, not sharply defined, which are but slightly raised above the level of the mucous membrane. The spots vary in size from the head of a pin to a lentil; they are discrete or joined together in irregular groups. These spots are given a characteristic appearance by the presence in their center of small, whitish, glistening punctate, apparently vesicular structures. These miliary vesicles are seen and felt to project above the surrounding parts. The conjunctiva is hyperemic throughout and, besides the injection of the fine blood vessels, also presents a punctate redness and miliary projections similar to those seen on the mucous membrane of the palate." "On the third day the red spots and miliary vesicles are found on the mucous membrane of the cheeks, especially opposite the space between the upper and lower molars."

Filatow, in the third Russian edition (1895) of his "Acute Infectious Diseases of Children," describes the buccal manifestations as follows: "Recently I have observed another symptom which makes it possible to diagnose measles in the prodromal stage, in many cases twenty-four to forty-eight hours before the eruption appears. This symptom consists of a branny desquamation of the epithelium of the mucous membrane of the lips and cheeks. In many cases it is dotted with these very delicate small white shreds of desquamating epithelium."

The following is Koplik's original description: "On the buccal mucous membrane and the inside of the lips we invariably see a distinct eruption. It consists of small irregular spots of a bright-red color. In the center of each spot there is noted, in strong daylight, a minute bluish-white speck. The red spots, with the accompanying specks of bluish-white color, are absolutely pathognomonic of beginning measles, and when seen can be relied upon as the forerunner of the skin eruption."

As has been shown by Koplik, the eruption described by Flindt and others is not pathognomonic of measles. The eruption which Flindt describes as *miliary vesicles* on red spots is entirely distinct from the minute white specks described by Koplik. They resemble, to some extent, the sudaminal eruption which one frequently sees in various diseases and which is also known as "miliaria crystallina." These small vesicles are not unlike minute drops of dew. Filatow undoubtedly described the Koplik's spots, but the latter author studied them more thoroughly, gave a detailed account of the cycle from their appearance to their disappearance, and, above all, emphasized the fact that they are pathognomonic.

The manifestation on the gums, the so-called "stomatite érythémato pultacée of the French, is thus described by Comby: "That which is constant and distinct is the enanthem on the buccal mucous membrane which precedes and accompanies the eruption. If the lips of the child are separated, the gums are found red and swollen, but not bleeding. In most cases they are covered by a white or opalescent epithelial deposit, which is very thin, easily detached by the fingernail and resembles slightly a false membrane." This condition of the gums is not pathognomonic of measles; it may also be present in scarlet fever, grippe and other infectious diseases. However, it is absent in German measles and in morbilliform erythemas.

In addition, I have sometimes observed hemorrhagic spots on the buccal mucous membrane as an early manifestation, also a redness and swelling of a small mass of lymphoid tissue on the posterior portion of the soft palate just above the notch between the uvula and the pillars of the fauces. Grumann has recently described (*Münch. Med. Woch.*, 1914, No. 2) small white specks or streaks on the tonsils which are present one or two days before the eruption. Sometimes they appear synchronously with the Koplik's spots, sometimes only the Koplik's spots are seen; often, however, the tonsillar spots are more distinct. In 10 early cases which I have recently observed the tonsillar spots were present in 4 and in 2 of these they were more distinct than the Koplik's spots.

The Koplik's spots do not always present the classical appearance as pictured in the text-books. Sometimes the red areola does not surround the white speck. It is not advisable to put the mucous membrane on the stretch, as the redness becomes less well marked and the white specks do not stand out so well by contrast. I believe it is exceedingly important to be familiar with *all* these oral manifestations; each has its more or less characteristic appearance and, taken together, they are absolutely diagnostic of measles.

(6) The caruncle at the inner canthus of the eye becomes red, swollen and injected at the very beginning of the catarrhal stage, and I have found it a very valuable sign in picking out the suspicious patients in the waiting room of the dispensary. On the reddened surface Koplik's spots can be frequently distinctly seen.

250 West 88th Street.

CAUSES AND TREATMENT OF CHRONIC CONJUNCTIVAL AFFECTIONS IN CHILDHOOD.* †

BY ANNA WESSELS WILLIAMS,
New York City

At present the comparative incidence of severe chronic conjunctival affections throughout most of the world is not great. But in certain areas practically all of the natives exhibit more or less chronic lesions in the conjunctiva, chief among which, both in frequency and dangerous consequences is the condition called trachoma.

Several such areas exist in our own country—for example, in the Kentucky mountains and on some of our Indian Reservations, and many of our immigrants come from such areas in the Eastern Hemisphere. Therefore, since this disease is supposed to spread insidiously, it behooves us, even though we come from a part of the country apparently free from such a condition, to keep in mind the known facts in regard to it, especially in regard to its etiology and prophylaxis.

Furthermore, since New York City is the port of entry of most of our immigrants, and since, however careful, the port officers find it difficult to exclude diseases in insidious stages, it is most of all the duty of the citizens of New York State and, in particular, of New York City, to take into serious consideration the prevalence, causes and prevention of such conditions.

Until recently, in New York City, chronic conjunctival affections and trachoma were almost synonymous. For, in the great majority of these chronic conditions, follicles are present, and when follicles are found on the inner surface of the lids the condition is called "granular lids." This meant—and still means to some, I am sorry to say—"trachoma." Thus New York City, especially on the lower East Side, had the reputation of being a hot-bed of trachoma.

For the past four years we have been making a concentrated study of the chronic conjunctival affections in the children of the lower East Side of the city[1], and as a result we have shown that the great majority of conjunctival follicles, however many there be, and wherever situated, are, under our conditions of study, benign.

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* From the Bureau of Laboratories, Health Department of New York City.

† Read before the Pediatric Section of the New York State Medical Society, April 30, 1914.

[1] *Journal of Infectious Diseases*, 1914, XIV., 261.

By our *conditions of study* I mean that during the whole time these cases were under observation we sought out and treated in their homes as well as at the clinics all cases showing secreting conjunctivitis of whatever grade, but particularly the acute cases.

TABLE I.

CHRONIC CONJUNCTIVAL AFFECTIONS IN CHILDREN.

DIAGNOSIS	APPROXIMATE NO. OF CASES	CAUSES
Folliculosis	2,500	Staphylococcus pyogenes.
	(300)	Hemoglobinophilic bacilli. (Influenza and Koch-Weeks B.)
	(5)	Pneumo-streptococcus group.
		Other microbes.
Follicular Conjunctivitis	700 (100)	Continued slight irritation due to a lymphoid tendency.
Papillary Conjunctivitis	350 (10)	Hemoglobinophilic bacilli (in a susceptible eye). Other microbes occasionally.
Cicatricial Conjunctivitis	(100)	Repeated infections with hemoglobinophilic bacilli and certain other microbes. Tubercle bacilli. Treponema pallidum. Gonococci, diphtheria bacilli. Operations, etc.
Chronic Catarrhal Conjunctivitis	50	Morax-Axenfeld bacillus. Repeated attacks of other microbes. Unknown microbes (spring catarrh).

In Table I., second column, we have indicated why we lay special emphasis upon the acute cases. Among the 2,500 and more cases of folliculosis (follicles on otherwise apparently normal conjunctiva) only about 300 have subsequently had from time to time an added infection (follicular conjunctivitis); among the 700 and more cases that have first presented themselves as follicular conjunctivitis, 100 have later shown a thickened conjunctiva, due to apparent diffuse hyperplasia (papillary conjunctivitis, formerly called acute trachoma); among the 350 cases first presenting themselves as papillary conjunctivitis only 10 have shown cicatricial changes, and these are complicated by the fact that they had earlier undergone the operation of expression. Now, as you see under *Causes* in this table, the chief cause of the more intense conditions (groups 2-4) according to our findings, is infection with hemoglobinophilic bacilli. The influenza bacillus is the type of this group of microbes, and we have found that the Koch-Weeks bacillus also belongs to it in a *strict sense.* The Koch-Weeks bacillus, you remember, is the cause of acute contagious conjunctivitis, or "pink eye." The bacilli found in our acute contagious conjunctivitis cases (we have studied about 500) are absolutely indistinguishable from those found in our chronic cases; therefore we may conclude that these chronic cases act as carriers for the acute and that the uncared-for acute cases may become chronic cases. Hence our reason for hunting up the acute cases, and following them up until we are sure of cure.

TABLE II.

HYPOTHESES IN REGARD TO NATURE OF "TRACHOMA INCLUSIONS."

I.	Peculiar organisms called chlamydozoa, causing "trachoma."	Halberstaedter and Prowazcek	1907
II.	Involuted gonococci="microgonococci," causing "trachoma."	Herzog	1910
III.	Cell degenerations.	Addario	1910
IV.	An unknown micro-organism having nothing to do with trachoma, causing conjunctivitis.	Noguchi and Cohen	1910
V.	Certain bacteria growing in intracellular nests—hemoglobinophilic bacilli in certain cases of papillary conjunctivitis ("acute trachoma"), gonococci in gonorrheal conjunctivitis, and probably one or two other species of bacteria in certain other cases.	Williams	1912
VI.	A specific bacterium, causing "Inclusion conjunctivitis."	Noguchi and Cohen	1913

Our conclusion that these hemoglobinophilic bacilli are the cause of many of these more chronic conditions as well as of the acute, was strengthened by the facts that we found the famous *trachoma inclusions* coincidently with these bacilli so frequently at certain stages of inflammation, and that, morphologically, inclusions and bacilli have a similar cycle of growth. We have found these inclusions also in a certain number of cases of acute conjunctivitis. Similar cell inclusions, as you know, have been found in gonorrheal ophthalmia, but we have shown that the gonococcus also in its growth may show granular changes similar to those seen in the cell inclusions in these cases, so we have come to the conclusion that trachoma inclusions are simply nests of growing bacteria in the epithelial cells of the conjunctiva under certain conditions, hemoglobinophilic bacilli in some cases, gonococci in others, and possibly a few other varieties of bacteria in others. Table II. shows the various hypotheses in regard to the nature of these cell inclusions.

If our hypothesis is true, it means that we must more than ever try to establish practical measures for caring for the acute conditions, as the best prophylaxis for the chronic. In the homes of the well-to-do this is done more or less; though I do not think practicing physicians as a whole realize the importance of being sure of a cure before the case is dismissed. In the homes of the poor it is not done so far, and the larger part of the public school children come from such homes. The dispensaries with their out-patient department are not adequate under the present system. The health departments are not yet adequate. Perhaps the ideal way—and it seems to be the way we are approaching—is coöperation between the health department, the education department and the dispensaries.

In the meantime, until a practical plan is worked out, the cases among the poor must be cared for as best we can, and we propose an extension of the school clinic plan which we have started experimentally in Public School 21.

Dr. von Sholly, who has had practical charge of this clinic, has reported elsewhere how it is managed and what results we have so far obtained.[2]

By such a system we may reach more quickly and surely all of these cases due to the causes enumerated in Table I. We believe that several of these causes operating in uncared-for eyes, in those children especially with a tendency to the production of lymphatic tissue, may produce the condition called trachoma, including the so-called typical pannus and fibrous tissue formations.

As to the treatment of eyes that already show marked chronic changes when we first see them, we do not differ materially from the methods given in text books on ophthalmology. But we emphasize the individual factor and give on the whole much less energetic treatment than is recommended. With our rules of hygiene carried out and our cases shielded from reinfection from acute cases in the homes, it is surprising how little treatment the majority of cases seem to require.

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[2] *Journal of Infectious* Diseases, 1914, XIV., 281. (See page 934, this number of ARCHIVES.)

We have summarized our studies as follows:

(1) The written descriptions of trachoma do not agree as to a clinical or pathologic entity.

(2) Among the children of sixty public schools in the crowded lower East Side of New York City (supposed to be a hot-bed of trachoma) during the past four years we have found no cases of conjunctival affections answering in their entirety to the classic descriptions of trachoma.

(3) None of the 3,000 and more cases of follicular affections in these children have developed cicatricial changes due to infection; on the contrary, the great majority of them now present normal conjunctivas. We attribute these results chiefly to the following measures:

(*a*) The carrying out of preventive methods of treatment, such as ophthalmia schools and school clinics, summer camps, mothers' demonstration classes, home instructions, and "follow-up" work.

(*b*) More minute care of acute, as well as of chronic cases, including the specific treatment given at clinics and the follow-up work in the homes.

(*c*) Non-operative procedures in a large number of cases formerly operated upon.

(4) Trachoma inclusions are nests of growing bacteria in epithelial cells—hemoglobinophilic bacilli in certain cases of papillary conjunctivitis, gonococci in certain cases of gonorrheal conjunctivitis and possibly other bacteria in certain other cases of conjunctivitis.

(5) If trachoma is present or should be introduced among our school children it may be controlled by methods which are within practical limits.

PAROTID ABLATION AND PLURIGLANDULAR INSUFFICIENCY.—Lorenzo Neri (*Giorn. Internl. delle Sci. Med.*) has shown by experiments on dogs and rabbits that following extirpation of the parotids there are structural changes in the thyroid, ovaries, testicles, pancreas, suprarenals, spleen and kidneys. These changes consist at first in a diminution in tinctorial reactions, and later in an involution and atrophy of the respective organs with an intra- and extracellular fatty infiltration.—*Medical Record.*

RECORD CHARTS FOR THE NEW BORN.*

BY WALTER LESTER CARR, M.D.,
New York

The case reports here presented are made to suit my own need, and if adopted by any of the members present, they will no doubt be modified to meet special requirements. I have arranged all my card histories for a unit size of 4 by 6 inches, as a history blank of this measurement is easily carried. If a larger history is needed the size may be doubled and a firm linen paper does not break in the fold.

Name ______ Date ______
Date of Birth ______ Sex ______ Weight ______ Length ______ Condition ______
Heart ______ Lungs ______ Head ______ Labor ______
Term ______ Position ______ Forceps ______ Injuries ______
Eyes treated with ______ Cord dressed with ______

Day. Date, 191 Temp. A. M. P. M. Weight Pulse A. M. P. M. Umbilicus Respiration Eyes Nursing Skin Stools { Number / Color } Urine Vomiting Directions	Day. Date, 191 Temp. A. M. P. M. Weight Pulse A. M. P. M. Umbilicus Respiration Eyes Nursing Skin Stools { Number / Color } Urine Vomiting Directions
Day Date, 191 Temp. A. M. P. M. Weight Pulse A. M. P. M. Umbilicus Respiration Eyes Nursing Skin Stools { Number / Color } Urine Vomiting Directions	Day. Date, 191 Temp. A. M. P. M. Weight Pulse A. M. P. M. Umbilicus Respiration Eyes Nursing Skin Stools { Number / Color } Urine Vomiting Directions

Fig. 1

The first record, Fig. 1, is for my personal use when I see a baby shortly after birth and also for the obstetrician who is in charge, so that attention may be directed to the care of the baby. The essentials I regard as of the greatest importance are inserted in the upper part of the history, "Eyes treated with ——, cord dressed with ——," and cover the most important part of the primary management of the new born. The other headings are arranged for the average case and may be used every day or at the time of the physician's visits.

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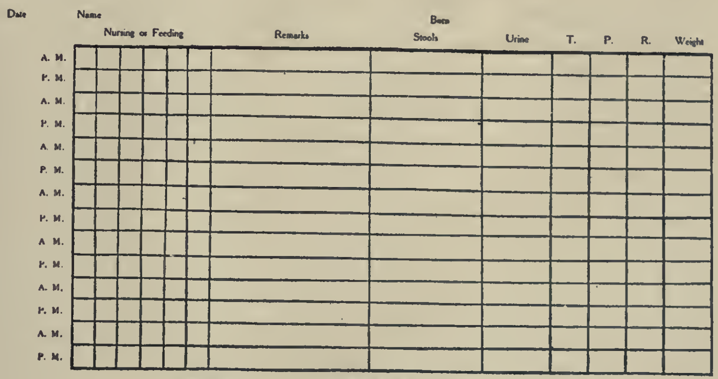
* Read before the Pediatric Section of the Medical Society of the State of New York, April 28, 1914.

The chart shown in Fig. 2 is to be used in fixing the time for nursing or feeding and to aid the nurse or mother in establishing a routine. This chart is of value for babies whose nutrition is poor and who require systematic oversight.


Date
Name
Born
Nursing or Feeding
Remarks
Stools
Urine
T.
P.
R.
Weight
A. M.
P. M.
A. M.
P. M.
A. M.
P. M.
A. M.
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A. M.
P. M.
A. M.
P. M.

Nurse every.................hours during the day. Every.................hours at night or
Feed every.................hours during the day. Every.................hours at night.
....Feedings in twenty-four hours ....Oz. each.
Take.................Oz. Milk from Top of Quart Bottle, mix and use of this
" ....Oz. Milk
" ....Oz. Boiled Water
" ....Oz. Lime Water
" ....Oz. Milk Sugar
Oz. Make...........Bottles

Orders:

Fig. 2

THE TREATMENT OF DIPHTHERIA BACILLUS CARRIERS WITH BOUILLON CULTURES OF STAPHYLOCOCCUS PYOGENES AUREUS.—J. D. Rolleston describes (*British Journal of Children's Diseases*, July, 1913) 10 chronic diphtheria bacillus carriers who were treated by spraying and swabbing the throat and nose with a bouillon culture of staphylococcus pyogenes aureus. In 6 faucial cases the findings were negative within two to seven days after starting the treatment. In the 2 nasal cases no result was obtained. The method should not be employed except late during convalescence. A mild form of sore throat was produced within a few days, and there was considerable malaise; the symptoms were of short duration. The culture is easily prepared and no injections are required, so that the method has advantages over the endotoxin treatment. The histories of the cases are described. There was a death in an infant of three months who had been admitted with nasal diphtheria and congenital syphilis. In this case the terminal bronchopneumonia developed nearly three weeks after the use of the spray.—*Universal Medical Record.*

HEMIPARESIS AND HEMIPLEGIA AS EARLY SYMPTOMS OF TUBERCULOUS MENINGITIS.*

BY L. W. SAUER, M.D.,
Chicago, Ill.

The unusual course of the following 2 cases of tuberculous meningitis warrants their publication:—

CASE I. Barbara P., two years old.

Family History.—The invalid father developed an open phthisis about three months before the patient took sick.

Past History.—A few months ago the patient slowly recuperated from a mild attack of bronchitis. About six weeks ago she showed a marked change in disposition, poor appetite and loss in weight, but in a few days her general condition again improved. After some weeks a paresis of the left arm and leg suddenly appeared, which progressed to a hemiplegia within three days. The slight rise in temperature disappeared within the next twenty-four hours, and the paralysis became less pronounced within the next few days. Since there was an epidemic of acute anterior poliomyelitis in the vicinity, a diagnosis of Heine-Medin's disease was made. After a few days, however, tonic and clonic convulsions set in and the sensorium became perturbed. The eyes were rotated to the right, trismus and opisthotonus became marked. The reflexes were exaggerated.

Physical Examination.—The well-developed, well-nourished child lies in relatively deep coma. The eyes are half open, the pupils react slowly to light; there is a slight degree of strabismus, but no facial paralysis. The neck is arched and somewhat stiff. The internal organs are apparently normal, the patellar reflexes are increased, Babinski is negative, there is no ankle clonus, the extremities are spastic, von Pirquet is positive, the fluid is clear, lymphocytes predominate, a fibrin network forms on standing, but no tubercle bacilli were found.

The child died twenty-two days after the onset of the paresis.

EXCERPT FROM THE AUTOPSY REPORT:—

Brain.—The vessels are dilated, the cortex and medullary substance are covered with a thick, gelatinous exudate in which there is a great number of small, gray-yellow specks. These miliary tubercles are especially abundant in the Sylvian fissure, also between the cerebellum and medulla oblongata. The tubercles follow the course of the vessels into the brain substance. The ventricles are distended with fluid.

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* From the Otho S. A. Sprague Memorial Institute Laboratory of the Children's Memorial Hospital, Chicago.

Lungs.—There is a focus 7 m.m. in diameter, consisting of a number of small conglomerate tubercles. It is in the middle of the left lower lobe. Miliary tubercles are scattered throughout both lungs, the left bronchial glands are caseous and enlarged. The largest is 1 x 0.5 cm. on section. There are small tubercles in the right tracheal glands.

Anatomical Diagnosis.—Primary tuberculosis of lung, tuberculous bronchial and tracheal lymphodenitis, miliary tuberculosis, tuberculous meningitis.

CASE II. Bernard M., twenty-five months old.

Family History—The father died of phthisis eight months ago, having spent his last ten months in a sanitorium.

Past History.—The patient had an uncomplicated pneumonia when twelve months old; when eighteen a rigidity of the neck and fever, which cleared up within the next three months.

Present Complaint.—Ten days ago the apparently well child suddenly developed fever, diarrhea and vomiting. He was slightly drowsy at the time, but recovered quickly, and was apparently well five days later. Three days ago he fell while playing, and when picked up the mother noticed that he could not move his right leg, that the right eyelid could not be raised and that the right angle of the mouth drooped. The voice became nasal during the past day and this morning the mother noticed that he could not use his right arm.

Physical Examination.—The well-developed, very well-nourished boy is drowsy, but answers questions promptly. There is a slight right-sided facial paralysis (upper and lower). The pupils are equal and react to light and accommodation. The right arm and leg are paretic, the paresis being more pronounced distally. Pain sense is normal. The patient can walk, but drags the right leg. The toe-drop is very apparent; the patellar reflex is more lively on the right side. Oppenheim, Kernig and Brudzinski signs are negative. There is a foot clonus on the right. The spinal fluid pressure is scarcely increased, the fluid is clear, Nonne test is positive, lymphocytes predominate, and there are 54 cells to the c.mm.

In the course of the disease the hemiparesis developed into a hemiplegia, the neck became rigid, Oppenheim and Babinski signs became positive on the right side. The pupils reacted slowly to light, an internal strabismus became marked and a choked disc was present. Coma set in; the spinal fluid remained clear, Nonne and Noguchi tests were positive and the extremities became spastic a few days before death.

EXCERPT FROM THE AUTOPSY REPORT:—

Brain.—On the lower surface is a fibrino-purulent exudate, which is more pronounced on the left side. The pia is thickened along the left Sylvian fissure, in the vicinity of which the brain substance shows induration. There is more fluid in the left ventricle than in the right. It is cloudy and contains flakes. There are some tubercles in the pia.

Lungs.—There is a hard, lintel-sized focus in the right lung in the region of the bifurcation of the trachea. It is apparently tuberculous and is surrounded by a zone of hepatized lung tissue. Near this focus is a bean-sized lymph gland, with hard, fibrous capsule and caseous center. Close by is another enlarged lymph gland with similar character.

Liver, spleen, kidneys and peritoneum contain small tubercles.

Anatomical Diagnosis.—Primary tuberculosis of lungs, conglomerate tubercles in the left Sylvian fissure, miliary tuberculosis, tuberculous meningitis.

The paresis, which rapidly developed into a paralysis, was the first major symptom of an existing meningitis in both of the above-described cases, so that a diagnosis of acute anterior poliomyelitis was for a time plausible. Especially was this true in the first case, where the hemiplegia cleared up for a short time. It is well known that a hemiplegia may develop in the course of a tuberculous meningitis (Heubner, Oppenheim), but as far as could be ascertained from the literature, all early hemiplegias were preceded by some other major nervous symptom, such as convulsions, severe headache or vomiting. H. Koch cites several cases of early hemiparesis and hemiplegias, and adds 3 cases which he himself had observed. In his own cases the paralysis was invariably preceded by headaches, convulsions or vomiting. The same may be said of the cited cases of Henoch, Hirschberg (typus inversus), Schlesinger and Zappert (the article by E. D' Espine et Picot was not accessible).

In all of the heretofore described cases of early hemiparesis or hemiplegia in tuberculous meningitis, some other major nervous symptom preceded the paralysis. In our 2 cases the first symptom which showed central nervous system involvement was the paralysis. This does not mean that it was the first symptom of the existing tuberculous meningitis, for in our first case there was a temporary change in disposition, accompanied by loss of appetite and weight. In our second case we are compelled to lay emphasis on the temporary stiffness of the neck and fever which developed when the patient was eighteen months old. Heubner seems to be the only authority who attempts to explain the hemiplegia developing in the course of a tuberculous meningitis. He says that the acute hydrocephalus is the causative factor. The course of the disease in our 2 cases does not support Heubner's view very well. It might be mentioned that Zappert found a striking preponderance of tubercles on the side opposite the hemiplegia, but he does not offer this as an explanation for the hemiplegia.

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BACILLARY PERICARDITIS (TUBERCULOUS).—Fromberg (*Deut. Med. Woch.,* August 7, 1913) reports an autopsy find of the above character and gives the literature of the subject. His patient, an old woman, died of uremia with numerous complications. The tuberculous nature of the pericarditis was recognized only by aid of the microscope, so that such a condition is evidently readily overlooked. Simmonds (1898) states that the condition of isolated pericardial tuberculosis is not so rare, while in 1904 Askanazy insists that a purely idiopathic case is decidedly rare. Other pathologists are in agreement with Simmonds. The author concludes as follows: There is a true isolated bacillary disease of the pericardium in which we do not find any of the histological components—neither tubercles, giant cells, nor caseation. The human tubercle bacillus simply determines an ordinary pericarditis—in other words, exerts a non-specific action. This condition must be kept separate in the mind from specific tuberculosis of the pericardium.—*Universal Medical Record.*

THE CAUSE AND CURE OF NIGHT TERRORS IN CHILDREN.

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The effect of emotions, like fear, has now been studied by experiments on animals,* by which it has been shown that the secretions of the glands can be so changed as to cause even death. However, the effects soon pass away unless the emotion is kept in mind by the association of ideas connecting it with some oft-recurring object or event. It is in these cases that the psycho-pathologist can unravel the often complex conditions which keep in the patient's mind distressing mental attitudes.

The cases related here are given as illustrations to show the great sociological importance of conditions purely psychological and to show that these can be removed with precision by physicians who are trained in doing so.

PERSISTENCE OF A NIGHT TERROR—ITS CURE.

A girl of sixteen was referred by Dr. Litchfield, of Pittsburgh, November, 1913, on account of great nervousness for years. She has never been regularly to school until the fall, when she had been sent to boarding school after convalescing from appendectomy, but had become so nervous that she had to return in two days. Inquiry showed that she would frequently wake in the night very much afraid unless she were soothed by someone sleeping with her, so that she could never sleep alone. Further inquiries showed that a servant had told terrifying stories to her sister as a child; the horrors this brought ran through a family of 3 children, but they passed away from all of them except this patient. She had been much indulged between the ages of three and six, and had been somewhat spoiled since, owing to a supposed weak heart, and always been considered a weakly child. Her father and an aunt had been timorous as children; the latter for nine years had not dared to be alone for a moment.

Examination showed feeble reflexes, becoming active on reenforcement; muscle tone, fair; weight, 108 pounds; pulse, 104 during examination, although patient said she was not excited; cardiac sounds, closed; chest expansion, free. Appetite said to be good, with certain dislikes; walking tires her, but dancing and tennis do not. For heterophoria she was prescribed glasses, but does not use them.

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* See the work of Pawlow on "The Digestive Glands," of Cannon on "The Adrenal Gland," and Crile on "The Thyroid Gland."

Psychic functions are unimpaired, except that she just wants someone with her when in bed. Her fears are either of fires or burglars, and they only occur when in bed or asleep; she whines when dreaming and wakes frightened, but never screams but clutches her companion desperately for reassurance. She is sure she wants to get rid of this trouble. She cannot remember the first occasion of fear. Noises, such as creaking floors, make her think there is someone in the house, although she knows positively there is not, but cannot make herself believe it. She is ashamed of the emotion and will go to bed alone, although terrified, if there is someone else upstairs, but not unless, but will wait until her mother comes unless they are there. She imagines a burglar might hurt her, if pushed to it.

Analysis shows that there is no definite fear of what he might do to her, but that the fear is of the unknown, and although it might help her to know it, it might be too terrible. Her agitation upon speaking of this she attributes to her shame of being "babyish." I explain there is no shame in what one cannot help, but she cannot, until an understanding is gained through analyzing the situation. She is not less frightened when away from home, but any person in the room will tranquilize her fear upon wakening if she can touch them. The night fear is quite different from any fears in the daytime.

After the analysis she was asked to go home and write out her impressions of the situation, which she did as follows:—

"The earliest instance I can remember was about eight years ago, when my nurse sat in the next room while I went to sleep. For five or six years afterward someone was with me when I was going to sleep. If I woke up in the middle of the night—which I usually did—I would be terrified and go into mother's bed, with her, in the next room. It is only within the last few months that she has been sleeping in the same room with me the entire night. Before that I always went to bed in the room next hers, but very rarely remained there all night. I cannot ever remember having the nurse put me to bed and then leaving me to go to sleep by myself. She was always in the next room. It made very little difference whether my mother, nurse or sister were with me. I preferred mother, but would have any one rather than be alone. I was always worse in our city home than in our country home, because I thought there would more likely be burglars in the city than way off in the country. I would go to sleep more quickly in the country, but would always have someone with me.

"As long as I can remember I have dreaded the night. I always awake a long time after going to bed fighting with my terror of burglars. Every sound made me think of them and I used to hold my ears shut so that I could not hear the floor creak and try to go to sleep in that way. So when I thought of those long, sleepless hours I would wish there was no such thing as night."

Her dread is mingled with self-contempt at her "silly babyishness." Three dreams were obtained. The first and second were of a burglar entering a window. The analysis showed only that the intruder aimed to shoot her sister who was standing up behind her; a dream of fears of elevators led to no pertinent associations.

As the dream analysis was so unfruitful, I believed it best to at once proceed to reconditioning of the psychological reactions. This was attempted in the first place by studying the child's power of understanding of what I gave her to read about the psychology of fear, and by making clear to her what she could not understand alone. In the second place, she was given exercises in mental concentration, and as she became more proficient in these was urged to apply them to the study of her own feelings of nocturnal apprehensions. The principle she was made to grasp was that fear and shame of her fears prevented her from facing and examining them, which was the essential preliminary to the understanding which would make them disappear. In ten days she returned home, not yet able to sleep alone, but beginning to obtain mastery. A month later her mother wrote me that she was entirely well and when she awakened in the night would quietly turn over and go to sleep without troubling anyone and was physically and in mental health better than at any time in her life.*

A CASE WHERE NIGHT PHOBIA WAS PREVENTED.

The formation of a night-terror was nipped in the bud in the case of a boy aged three and three-quarters. I shall try to explain the method. For several weeks he had been visiting the zoological garden every afternoon, in the company of a French maid of exceptionally forceful character, and apparently free from the superstitiousness of the average nurse. For a long time all went well, until one evening he began to cry in bed soon after he was left for the night. At this unusual occurrence I mounted the stairs and enquired the cause of the boy's trouble. He said there were lions in the house and that he did not want to stay alone, as he was afraid they would eat him. The source of the idea had been that the lions had roared more loudly than usual on that particular afternoon, and he had been much impressed, standing for some time quite motionless before the cage, though unterrified. I soon convinced the boy that the lions had to remain in their cages and could not get out, hence there were none in the house, so that there was no occasion for fear. Of course, it was first necessary to give him the feeling of security gained by embracing me, and, secondly, to begin the conversation by talking of something else—I have forgotten what. In this way the state of terror was dismissed, and the feeling of protection was induced before we returned to the subject of the lions; then we made rather a joke of the funny roaring of the lions before we had finished, and he finally lay down with the solemn purpose to go to sleep and think, as I suggested, of the tramcars and motors passing outside his open window. It was all a very simple substitution, but it was the prevention of what might have become a serious fear-psychosis if injudiciously handled.

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* This child has been at school now for a year and is quite normal.

It should not be difficult to see that these night terrors are a product of a suggestion while awake, implicit or explicit. It should not be difficult for those who are forewarned to prevent morbid fears of this type. I may cite the case of a Southern lady who could never enter a dark place without feeling an indescribable horror. No hereditary psychopathy could be invoked to explain her dread, for none of her three daughters had the least fear of the dark, and, indeed, they used to be sent by their school fellows into dark and eerie places without experiencing the least trepidation. The difference was that as children they were protected by their mother from tales of the plantation negroes, who knew that dismissal would follow transgression of the prohibition.

If I say to a small boy that a bear will eat him up, the effect upon his emotions entirely differs whether I make the remark with portentous gravity and horror, or whether I say it with bubbling joviality, as evidently a huge joke. In the first eventuality the boy will rush to my side in terror and try to be saved from the bear, and a phobia is in course of construction; with the latter proceeding the boy will laugh consumedly, and it would not take much to make him enter the cage and strike the bear. But even when terrified a child feels a refuge in the protection of his elders during the day, when they are rarely absent.

It must be remembered that explicit utterance is not essential for the conveyance of ideas;* for in the child a vague general notion is quite as effective for producing emotion as a clear-cut concept. Thus in Henry James' novel, "What Maisie Knew," the whole suggestion conveyed by the governess to her two charges was implicit in her general attitude, for until the end there was not one explicit statement of her fear. Now, the explanation of this is very simple; it depends upon the fact that gesture precedes speech as a vehicle of thought. The infant comprehends the varying attitudes and vocal tones of its mother long before it can distinguish different words; and in most people this channel of information remains an important mode by which they are influenced, often quite unconsciously. Those of us who have studied the psychology of crowds are well aware of this, as likewise are the observers who compare nation with nation as regards gestural expression. Even adults of the same race, except the more cultivated, are swayed by a comedian much more through his gestures and intonation than by his actual utterance. So with an orator or debator, or, indeed, any one who tries to persuade us, even to purchase something from them, our foolish minds are guided by the stress of an intonation, the cut of the hair, the character of the clothing, the glance of the eye, far more than by the arguments used or the words uttered, and with children this is far more so.

At night, however, the child is alone, and his little consciousness cannot find the support of others. Before the kaleidoscope of his dreams pass the various images and accompanying emotions of his waking life, so that if any of these images has become linked with fear it is certain to bring with it terror, as it surges into dream in the night, and the child jumps up, awakened, in panic, finding no one near him upon whom to lean.

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* See "Hysteria: Its Nature," shown by a Case. *International Clinics*, 1908, Vol. III.

Impaired efficiency from psychological causes is quite common in children. When a nervousness of this origin shows itself a proper analysis of a child's mind is the first step toward its removal. A number of cases of this description, the first ever published, were reported by me to the American Psychopathological Association.†

One of these, a girl of eight, was kept from school over a year. A simple analysis, lasting half an hour, revealed that the child had become over-scrupulous from injudicious teaching of physiology. The condition was rectified, she was sent back to school, and she is now perfectly well.

The ardent affection of another little girl was mistakenly repulsed by the parents. This led to melancholia. After one hour's analysis she was cured in two weeks, and restored to the class of normal children.

On account of the over-anxiety of his mother, another little boy developed terrifying hallucinations even in the daytime; and, of course, school was out of question, as the boy was supposed to be of a hopelessly nervous temperament. Half an hour's analysis served to explain this condition, and a few weeks of special training enabled him to return to school quite well.

A boy of fourteen had developed since three a jealousy of a little brother, which caused such shame that he devoted half his time to penances; the meaning of these was unknown to his relatives. An hour's analysis and four re-educative sittings sufficed to transform his character and turn him toward useful activities.

All these were cases of poor adaptation, which was supposed to be due to inherent nervousness more or less hopeless. They were really the results of faulty handling, and required only a proper comprehension of their psychological constitution.

All were the children of people of superior attainments and conscience.

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† See *American Journal of Medical Sciences*, December, 1912; Medical Annals, January, 1913; Journal Abnormal Psychology, February; Post-graduate, September.

A SIMPLE SYRINGE METHOD FOR THE TRANSFER OF BLOOD FROM DONOR TO RECIPIENT. ITS APPLICATION IN THE TREATMENT OF SCARLET FEVER AND OTHER CONDITIONS.

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During the past few years various methods have been elaborated for the transfer of human blood from donor to patient. At first defibrinated blood, and later fresh blood was used. It is interesting to note that even twenty years ago von Ziemssen had employed with success a number of piston syringes and needles for the transfusion of fresh human blood into the vein of the recipient. Recently E. Lindeman[1] published a fairly simple and practical method for the transfusion of blood by means of syringes and special telescoping canulæ. The method works well in his own hands, but has failed in those of a number of others, who either themselves lack the necessary skill or have not the skillful assistants needed for carrying out the transfusion. At least three such assistants and twelve or more Record syringes and special canulæ are necessary.

In addition to these inherent technical difficulties there are the associated dangers of transfusion into the vascular system of patients, *i.e.*, the dangers from hemolysis and agglutination, from the injection of bloodclots and from overdistention of the patient's heart. Hemolysis is a real factor, as fatal cases of hemolytic jaundice and severe hemoglobinuria have been reported, when incompatible blood has been transfused. The danger from agglutination is less, although here too serious results may follow for the patient, especially when agglutination is associated with hemolysis. According to von Dungern and Hirschfeld human beings can be divided by their iso-agglutinins into four groups, the blood of the members of each group being compatible only with each other. This has often necessitated the exclusion of 9 out of 10 donors, because their blood was agglutinable or hemolytic, or both agglutinable and hemolytic with the recipient's blood. The blood tests often require from three to four hours for their completion.

During the past few years the advantages of fresh human blood in various pathological conditions have been repeatedly demonstrated, but the difficulties inherent in the old methods of using the canulæ, and the new methods of using the syringes and canulæ have deterred a great many from employing transfusion of blood, except in large centers and nearby sections, where skillful surgical help was within easy reach.

To avoid these difficulties a method is here presented for the transfer of fresh non-coagulated blood from donor to recipient, which is simple and easily carried out and involves no further skill than the ability to draw off a syringeful of blood from a large vein in the donor and inject it rapidly into the muscle of the patient.

The entire outfit consists of one or two 20 or 30 c.c. "Record" syringes and needles of steel or platinum-iridium (B. & S. gauge No. 16 or No. 17). These needles are short and of a convenient caliber, and allow a rapid entrance and exit of blood from the syringe.

Two all-glass 25 c.c. "Luer" or "Burroughs-Wellcome" syringes with steel (B. W. & Co. No. 9) or platinum-iridium needles (Burroughs-Wellcome & Co. No. 23) will answer the purpose as well.

In an emergency any 10 or 20 c.c. syringe with a sharp, clean needle can be used.

As a tourniquet a small piece of rubber tubing and an artery forceps may be employed.

To carry out the transfer of blood, the donor is seated near the patient, who is in a recumbent position. The donor's veins at the bend of the elbow are made prominent by applying the tourniquet at the middle of the upper arm, care being taken not to obliterate the pulse. The skin is sterilized with alcohol and the median-cephalic or median-basilic vein is chosen. Places of injection on the recipient are also sterilized with alcohol or tr. iodin. As soon as the syringe is filled from the donor's vein, an assistant loosens the tourniquet and applies an alcohol sponge with slight pressure to the puncture opening. The operator immediately injects the blood into the muscle of the recipient, inserting the needle almost perpendicularly to the skin in adults, but more obliquely in children on account of the thinness of the muscle. After the injection the syringe and needle are thoroughly washed in sterile normal saline, which is kept ready in a glass beaker. The entire time required for the aspiration of the blood and its injection need not exceed sixty seconds, a period which is far below the usual coagulation time of blood. The procedure is now repeated, using the other arm of the donor. For the third injection we go back to the arm originally used, and insert the needle through the same opening in the skin, being guided thereby into the original opening in the vein. We can thus avoid the additional pain from several skin punctures at different places, and also avoid injuring the vein any more than necessary. If care is taken, no hematoma will form, and five to ten syringefuls of blood can be withdrawn from each vein.

The following muscles of the patient may be chosen and a syringeful of blood injected into each place:—

Upper Extremities.—(1) Deltoids (one injection); (2) triceps (two injections in adults, one in children); (3) supinator longus (one injection).

Lower Extremities.—(4) Outer regions of the thighs, where the needle passes through the aponeurosis of the extensor fasciæ femoris, and the blood is injected into the vastus externus (three injections in adults, two in children); (5) the calves, where the blood is injected into the gastrocnemius and soleus (two injections in adults, one in children); (6) the gluteal regions (one injection). If necessary, injections may be made even into the pectoral and interscapular muscles.

The injections are painless, except for the temporary slight discomfort associated with the entrance of the needle. No reaction follows, and the blood-mass appears to be rapidly absorbed, as indicated by the absence of any tumefaction, pain or induration at the end of twelve to sixteen hours. The muscles will be found supple, and to have regained their former size and consistence. These observations can be made especially well in young children with thin muscles. If the blood is injected into the subcutaneous tissues, discoloration of the skin, and some infiltration will be noted in twenty-four hours, which will persist for a number of days.

Experimental work carried on in some of the lower animals has verified the above clinical observations. Guinea pigs and rabbits were injected subcutaneously and intramuscularly with varying quantities of homologous blood. When examined at the end of an hour the blood was found clotted; at the end of twenty-four hours the greater part of the blood-mass had become absorbed from the muscles, and only a part of the serum from the subcutaneous tissues. At the end of three to four days moderate quantities of blood had been completely absorbed from the muscle, while at the site of each subcutaneous injection a large coagulated mass of blood was still present.

A recent clinical experience in an anemic child (hemoglobin, 36 per cent.; red blood cells, 2,520,000), that had received 250 c.c. of blood into its muscles, showed that no immediate rise in hemoglobin and red blood cells took place. At the end of twenty-four hours the hemoglobin and red blood count were still unchanged. Whether the absorption of the blood-mass will finally result in an increase of hemoglobin and cells cannot be foretold; the fresh serum, however, with all its valuable antitoxic, antibacterial and ferment properties, is rapidly taken up with little or no reaction on part of the surrounding tissues, if the injections have been made intramuscularly.

Meltzer and Auer[2] have shown that absorption from muscle occurs rapidly by way of the blood vessels, while from the subcutaneous tissues it is much slower and takes place by way of the lymphatics. "The effect of an intramuscular injection of adrenalin, curare, fluorescin or cocain stands nearest to that of an injection into the circulation and is far above that of a subcutaneous application."

These observations hold good also for colloids, as shown by Morgenroth and Levy.[3] They found that antitoxic serum is absorbed five to ten times faster from the muscle during the first three to six hours than from the subcutaneous tissues. These authors attribute the increased rapidity of absorption from the muscle to the richness of this tissue in blood vessels and also to the increased pressure within the muscle, which is absent in the loose subcutaneous tissue.

The ability to transfer fresh human blood in such a simple manner, and its assured absorption within a short time, would suggest a number of suitable conditions, in which the more difficult transfusion, or less efficient horse-serum are now used with advantage:—

(1) In cases of hemorrhage, to stop persistent oozing by increasing the coagulability of the blood, *e.g.*, hemorrhage from the respiratory and gastrointestinal tracts, after tonsillectomy, in jaundice, in gastric and duodenal ulcers, in typhoid fever, etc. E. Weil has recommended the injection of fresh serum in cases of hemorrhage and it has proved of great value. Horse-serum has been used with success in some cases; in many it has failed,

where blood transfusion was finally successful. The injection of heterologous sera (horse and rabbit) results in a local inflammatory reaction of the tissues which delays absorption and is probably the reason for some failures; in others, perhaps, the use of an old serum, where fresh serum was not available.

(2) In cases of hemophilia, the injection of fresh blood furnishes the necessary prothrombin. Repeated small transfusions have been recommended in these patients as a prophylactic measure.

(3) In certain chronic anemias: splenic and pernicious anemia, and the various leukemias. In these cases the donor's red blood cells probably do not remain very long in the patient's circulation.

In secondary acute anemias: after hemorrhage during major operations, ruptured ectopic gestation, etc.

(4) In severe surgical shock.

(5) In acute and chronic forms of sepsis.

(6) In the malnutrition of infants.

(7) As a prophylactic procedure before various major operations.

(8) In various toxemias, especially scarlet fever. In this disease convalescent serum has been used with considerable success in selected cases of early very toxic scarlet.

With the exception, possibly, of the very acute surgical anemias, and some of the chronic blood diseases, the transfer of fresh human blood, as here described, may be found to have most of the advantages of direct blood transfusion without its well-known disadvantages. As a special instance, a case can be cited of typhoid fever, complicated with diphtheria, in which there was constant oozing from the nasopharyngeal tissues. The injection of 150 c.c. of fresh human blood into the muscles of the patient promptly stopped the oozing, which had not been influenced by a previous injection of horse-serum.

The donors chosen should be free from syphilis and tuberculosis, a Wassermann test excluding the former, and a physical examination the latter.

APPLICATION IN THE TREATMENT OF SCARLET FEVER.

The method here described has suggested itself first in the treatment of the early very toxic forms of scarlet fever with fresh blood from convalescent patients.

Convalescent serum has been employed in small amounts for a number of years in the treatment of scarlet with varying degrees of success. It was not, however, until Reess and Jungman,[4] in 1912, recommended the intravenous injection of larger quantities of serum (from 50 to 100 c.c.) that consistent results could be obtained. Rowe[5] has had a similar experience. More recently R. Koch[6] has again drawn attention to the therapeutic value of the antibody content of the blood-serum of convalescent scarlet cases taken from the eighteenth to the twenty-fourth day after the acute stage of the disease, and preserved with a small amount of phenol (0.5 per cent. of a 1:15 aqueous solution). The author reports observations on 22 cases of severe scarlet fever treated with the serum. He noted critical drops in temperature and improvement in the general condition of the patients; no effect, however, was noted on the septic complications, like joint, middle-ear and gland infections. In a few of the cases the intravenous injection of the serum has given rise to chills and symptoms of collapse. The author concludes that the serum deteriorates on keeping and will be found to have little or no therapeutic value after two to three months.

The intramuscular injection of fresh convalescent blood was carried out with rather striking results on 2 patients at the Willard Parker Hospital (service of Dr. R. S. Haynes), and they are, therefore, reported here in detail:—

CASE I. E. G., nineteen years old, admitted to the hospital on December 20, 1914. History obtained from the father. Duration of illness twenty-four hours. Began with a sore throat, followed by a rash on which the diagnosis of scarlet fever was made. Temperature on admission, 103.5° F.; slight delirium, intense purple rash, congested throat, no exudate, negative Schick test.

December 21st.—Temperature, 105° F.; delirium more marked, eyes congested, dusky rash over entire body. The same evening, 250 c.c. of fresh blood from 2 convalescent patients (thirty-one and thirty-seven days) injected into the deltoids, triceps, and outer regions of both thighs. After the injection the temperature showed a critical drop of 4°, associated with a clearing up of the delirium, and a marked improvement in the general condition of the patient. Twenty-four hours later the temperature was normal and the patient made a rapid and uneventful recovery. Daily examination of the muscles at the sites of injection showed no local induration or tenderness.

CASE II. H. R., six years old, admitted to the hospital December 21, 1914. History of illness for three days before admission: General condition poor, intense dusky rash with small pelectical hemorrhages. Cervical adenitis. Throat congested and swollen, greenish exudate on tonsils. (Culture negative.)

December 24, 1914.—On the third day after admission the patient appeared toxic and cyanosed. Delirium present, cervical glands large and tender, lips bleeding and ulcerated, throat congested and swollen. Condition considered partly septic and the prognosis seemed doubtful; 125 c.c. of convalescent blood (twenty-one days) was injected into the deltoids, triceps and muscles of thigh. During the night following the injection the temperature showed a critical drop of 4°, followed by a temporary rise of 2°. Within the next twenty-four hours the temperature became normal, and the general condition of the patient was considerably improved. Daily examination of the muscles at the sites of injection showed that the greater part of the blood had become absorbed within the first sixteen hours. The muscles remained supple and were neither infiltrated nor tender. On the left thigh the injection was made partly subcutaneous, and here a persistent slight infiltration and bluish discoloration of the skin were noticeable for a number of days.

The ease with which fresh convalescent blood from adult donors can be given by this method would suggest the possibility of its more frequent use, not only in early and very severe toxic scarlet fever cases, but also as a routine procedure in the moderately severe cases. In such patients, 100 to 125 c.c. of blood can be given to children, 200 to 250 c.c. to adults. These injections may prevent the toxic effects of the disease upon the heart, kidneys and nervous system of the patient; also, by increasing his resistance and diminishing the inflammatory condition in the throat, prevent the secondary septic manifestations in glands, middle ears and joints.

The adult donors should be tested with the Wassermann reaction and their consent obtained for the removal of 200 to 300 c.c. of blood. For an adult patient two donors may be needed. In a contagious disease hospital such donors are always available. A record can be kept of their names and addresses, and, when required, donors can be sent to the homes of private patients, where they will be willing to furnish the requisite amount of blood for a small remuneration. Experiments are now in progress to test the efficiency of convalescent blood to which sodium citrate has been added to avoid coagulation. Such blood may be useful in shipping to distant places; the fresh blood, however, taken directly from the convalescent donor, will probably be found to be the most efficient method for the treatment of early toxic cases of scarlet fever.

SUMMARY AND CONCLUSIONS.

(1) A simple syringe method is described for the intramuscular injection of fresh human blood in quantities up to 600 c.c. at a sitting.

(2) The injection of homologous blood into muscle produces no inflammatory reaction and the resulting absorption is complete within three days, of the serum part alone probably in a few hours.

(3) The injection of homologous blood into subcutaneous tissue produces inflammatory induration and discoloration of the skin, and the resulting absorption is very much delayed.

(4) The availability of the method would recommend its further trial in the treatment of scarlet fever and other conditions in which transfusion of blood and serum injections have been advised.

I wish to thank Dr. William H. Park, Director of the Research Laboratory, for many valuable suggestions; also Mr. David Soletsky for assistance in carrying on the experimental work.

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SOCIETY REPORTS

ANNUAL JOINT MEETING OF THE NEW ENGLAND PEDIATRIC SOCIETY, THE PHILADELPHIA PEDIATRIC SOCIETY AND THE PEDIATRIC SECTION OF THE NEW YORK ACADEMY OF MEDICINE.

Held at the New York Academy of Medicine, November 5, 1914

Dr. William M. Polk, President of the New York Academy of Medicine, in the Chair

The visiting physicians spent the day inspecting the new building of the Department of Health and the exhibit of the Bureau of Child Hygiene; the exhibit of the New York Milk Committee at its Infant Welfare Experiment Station, 117 Washington Street, where a new experiment is being tried; the Research, Antitoxin and Vaccine Laboratories of the Department of Health, and the new pavilion for measles at the Contagious Disease Hospital. While at the laboratories the visitors witnessed a demonstration of Negri bodies and trachoma by Dr. Anna M. Williams and a demonstration of the Schick reaction by Dr. William H. Park and Dr. Zingher. In the afternoon a visit was made to the children's wards of the Presbyterian Hospital and to the Rockefeller Institute, and Dr. Holt gave a clinic at the Babies' Hospital. During the afternoon 170 men took part in the exercises.

One hundred and twenty had dinner at Delmonico's at half-past six, from which they proceeded to the Academy building for the scientific session.

EXPERIMENTAL AND CLINICAL STUDIES IN HEMOLYTIC JAUNDICE, WITH SPECIAL REFERENCE TO THE EFFECTS OF SPLENECTOMY.

Dr. Edward B. Krumbhaar, of Philadelphia, presented this communication, in which he first described the experiments of Dr. Pearce, himself, and other colleagues, which had been carried on for the past three years at the Research Laboratory of the University of Pennsylvania, after which he discussed the bearing of this experimental work on the clinical aspects of the various types of splenomegaly with anemia. He said that although they at first were concerned with the relation of the spleen to hemolytic jaundice, they soon found themselves confronted with the broader problem of the relation of the spleen to blood formation and destruction in general. This study had brought out many explainable facts and some that were apparently paradoxical. Their first experiments confirmed and elaborated the earlier observations of Banti and Joannovics that it was more difficult to produce jaundice by means of hemolytic serum in splenectomized than in normal dogs. Attempts to explain the cause of this phenomenon, which was directly related to clinical splenectomy for the cure of various conditions associated with hemolytic jaundice, led them to study the blood changes following splenectomy. They found that anemia always developed, reaching its maximum about the third week and reaching normal in about ten months. Pearce, Karsner and Peet found that the resistance of the red cells was increased after splenectomy both to hypotonic salt solution and to immune serum. Austin noticed that the greatest resistance to jaundice occurred at the same time as the greatest anemia developed and to test the connection between the two gave hemolytic serum to animals made anemic in other ways. He had found this same resistance and had concluded that the phenomena was partly due to the more resistant erythrocytes and partly to the fact that less blood was destroyed because there was less blood present to be destroyed. In testing the blood-forming powers of the spleen by comparing the blood going to and that coming from it, some authorities claimed to have found more red cells, white cells and hemoglobin in the splenic vein. Their experiments along these lines were negative, and it seemed that, in spite of evidence of occasional myeloid metaplasia in the spleen, they must accept the dictum that the red cells at least were formed only in the blood marrow. Asher and his pupils had offered as an explanation of the anemia following splenectomy that increased amounts of iron were lost through the stools, but here again their experiments failed to confirm such an explanation; they did find, however, that injection of splenic extracts intraperitoneally had a marked temporary effect in raising the count of erythrocytes, hemoglobin and leukocytes, presumably due to stimulation of the bone marrow. A possible explanation of the anemia following splenectomy was, therefore, that the bone marrow was deprived of a stimulating hormone. Explanation of the later recovery from anemia might also be found in that the lymph nodes were found enlarged after splenectomy and presumably had taken over some of the function of the spleen. Pearce and Pepper had found that bone marrow in splenectomized dogs frequently showed signs of active regeneration at the periods when the anemia was being recovered from. Although splenectomized dogs showed less tendency to jaundice when hemolytic agents were administered, nevertheless such agents caused a greater fall in blood counts, a more lasting damage, and a greater fragility of the red cells than in normal dogs. Apparently the lessened tendency to jaundice was connected in some way with the anemia caused by splenectomy, while the lessened power to recover from the hemolytic anemia must be attributed to the loss of some specific substance from the spleen. Banti had brought forth evidence of special hemolytic activity of the splenic extracts and of dissociated hemoglobin in the splenic vein, but their observations had failed to substantiate these claims. Joannovics and Pick had shown that chronic toluylendiamin poisoning caused fatty changes in the liver with liberation of unsaturated fatty acids, and Eppinger and King had shown that after splenectomy the amount of blood fat and cholesterin rose and the iodin number (combining value of the unsaturated fatty acids) of the blood dropped, indicating lessened degrees of hemolysis. In clinical conditions associated with blood destruction they also found an abnormally high iodin number and this was reduced after the case had been improved by splenectomy. The unsaturated fatty acids were well known as hemolytic agents, and the lessened blood destruction after splenectomy might thus be explained. The speaker then gave a review of the history and a detailed description of the different types of primary splenomegaly with anemia, namely, Gaucher's, Banti's, von Jaksch's, and the two types of hemolytic jaundice, the Hayem-Widal, or acquired form, and the Chauffard-Minkowski, or congenital or hereditary form. Gaucher's disease had but little in common with the other types of splenic anemia, and, though the negative character of the symptoms might cause it to be confused with Banti's disease, pathological examination should admit of a proper differential diagnosis. After describing the symptomatology of Banti's disease, the writer stated that, although the etiology of the disease was unknown, evidence pointed to the close causative relationship of the spleen. One would not expect the removal of a largely fibrotic organ to be attended with marked somatic changes, and it was precisely in the earlier stages of the disease in which splenectomy had proven most beneficial. The anemia infantum pseudoleukemia of von Jaksch was in all probability not an independent condition, but represented an atypical response of the infantile hemopoietical system to one or other of the primary diseases of the blood. The acquired and congenital types of hemolytic jaundice with splenomegaly (Hayem-Widal and Chauffard-Minkowski) possessed rather characteristic differences and he deemed it advisable to follow the Continental custom and consider them as independent conditions. In the congenital type the resistance of the red blood cells to hypotonic salt solution was much diminished and this furnished a simple differential test, the technique of which was described. The cardinal symptoms of these types of hemolytic jaundice with splenomegaly were a chronic enlargement of the spleen, existing with an acholuric non-obstructive jaundice, and anemia, frequently paroxysmal in character and varying in intensity. Increased blood destruction was indicated by increased urobilin in the urine, and various characteristic changes were found in the blood, the red cells showing diminished resistance to hypotonic salt solution, there being an increased number of reticulated cells with vital staining, and in the acquired form the phenomenon of autoagglutination of the red corpuscles. In the congenital form the subjects were often more icteric than sick, while the acquired form was usually ushered in with a definite attack of illness, the anemia became more grave, and the patient was distinctly more anemic than jaundiced. The congenital or familial form appeared to be more of an inherited dystrophy of the hemopoietic system, rendering the red blood cells more easily destructible. In discussing the morbid anatomy in hemolytic jaundice, the author said he had collected eight autopsies and seven splenectomies which showed chiefly congestion of the spleen, especially of the pulp cords, with increased pigment and macrophages. After reviewing the various ineffectual therapeutic measures that had been tried in these conditions, he stated that splenectomy seemed to offer the most hope for improvement or cure and should be considered, with due regard to conservatism, in all those diseases in which there was evidence of increased blood destruction referable to the spleen. In early Banti's disease and hemolytic jaundice, at least, the results had been excellent. In pernicious anemia, although improvement had followed in some cases, the value of splenectomy was more dubious, and this grave operation should only be tried where the indications were clear and other methods had proved unavailable.

ACUTE ACID INTOXICATION IN INFANTS AND CHILDREN: A STUDY OF 100 CONSECUTIVE CASES IN APPARENTLY EPIDEMIC FORM.

Dr. Carleton R. Metcalf, of Concord, N. H., presented this report of an epidemic which occurred last winter at Concord, N. H. There were in all 200 cases with 9 fatalities. The report presented consisted of 100 tabulated cases. The author considered the bearing of such etiological factors as age, environment, milk, water, diet and neurotic temperament, none of which alone nor any combined seemed to account for the outbreak. The tabulated report showed the frequency of such symptoms as diarrhea, vomiting, wasting, retracted abdomen, abdominal pain, icterus, etc. He also described the stools, vomitus and urine. The treatment consisted chiefly in dietetic measures and in the administration of soda and the citrates. The author also discussed the source of the acetone bodies and their relation to autointoxication.

THE OCCURRENCE AND SIGNIFICANCE OF MELITURIA IN INFANTS SUFFERING FROM NUTRITIONAL DISORDERS.

Dr. Oscar M. Schloss presented this paper, which concerned primarily the nature and significance of the reducing substance which commonly appeared in the urine of infants affected with nutritional disorders. Sugar, which was used in metabolism, was carried by the general circulation and it was obvious that sugar which appeared in the urine was derived from the blood sugar. Recent work had shown that normal blood sugar in infants ranged from 0.07 to 0.11 per cent., figures which were practically identical with those which obtained for adults. Although there was a tendency for the blood sugar to maintain a constant level, striking changes might occur following the ingestion of carbohydrate food. There was often a definite increase in the blood sugar shortly after a meal which reached its maximum in from one and one-half to two and one-half hours and then decreased. This increase might be effected by starch as well as sugar, though the rate of increase was slower and to a lesser degree. Owing to this fact, the blood for examination was usually withdrawn about three and one-half hours after a meal.

Dr. Schloss stated that there was a direct relationship between increased blood sugar and melituria. As a rule, a continued increase in blood sugar led to an excretion of sugar in the urine, although this effect might not be immediate. Often the hyperglycemia might precede the melituria for some time. A detailed consideration of the significance of increased blood sugar could be of little benefit, for, despite the great amount of work done in the mobilization and utilization of sugar, especially in diabetes, there were many essential factors which were unknown or under discussion. It seemed safe, however, to assume that hyperglycemia meant a disturbance in the balance between mobilization and consumption of sugar and often signified a decreased power of burning sugar, provided that the patient was afebrile and the diet normal.

The detection of a reducing substance in the urine of infants affected with gastroenteric disorders was by no means recent. Most of the earlier writers considered that the sugar was lactose derived from the food. Langstein and Steinitz found galactose in addition to lactose in 14 out of 38 cases of melituria. Luzzato also found galactose in the urine of infants. Finkelstein and Meyer were led to attach great importance to the melituria in nutritional disorders. They divided the cases into two groups: (1) Those in which the appearance of lactose in the urine was considered as indicative of an intestinal lesion through which lactose was absorbed before it was split by the inverting enzyme of the intestinal secretion. (2) Those cases in which galactose was found in the urine, and it was thought that the underlying cause was a diminished sugar tolerance, the liver probably being at fault.

Dr. Schloss's work comprised the study of the blood and urine of 235 infants. The preliminary tests of the urine were made by the reagents of Benedict and Nylander, and if the reducing substance was present in sufficient quantity further tests were carried out to determine its nature. There were 40 normal infants whose blood sugar ranged from 0.068 to 0.11 per cent. All were free from digestive disturbances and none showed the presence of sugar in the urine. The remaining 195 cases represented nutritional disorders ranging from the milder disturbances and dyspepsia to those of severe intoxication. For convenience the cases were roughly divided into three groups—mild, moderate and severe. The speaker demonstrated by means of charts that there was an association between the increased blood sugar and the presence of sugar in the urine. As a rule the cases with melituria showed hyperglycemia.

The next question considered was the nature of the sugar in the urine. In most instances the percentage ranged from 0.05 to 0.1 per cent. In such cases a determination of its nature with any degree of accuracy was impossible. In 27 cases the urine at some time contained 1 per cent. or more of sugar, and further tests were made to determine its nature. These examinations were shown in tabulated form, which demonstrated that the sugar was usually galactose or dextrose. Lactose occurred, but not alone, it being always associated with galactose.

The important facts brought out were: (1) Melituria was usually accompanied by an increase in blood sugar. (2) The sugar in the urine was a monosaccharide. These results indicated that a gross lesion of the intestine was not a direct cause of the melituria, but indicated strongly that the direct cause was a lowered tolerance to sugar. To definitely determine this tolerance tests were made on normal infants and others affected with nutritional disorders. The results showed definitely that there was a lowered tolerance to sugar in the nutritional disorders.

DIABETES IN EARLY INFANCY.—This is one of the rarest disorders, and Knox (*Johns Hopkins Hospital Bulletin,* September, 1913) has been able to collect but 16 cases during fifty-one years in which the diagnosis is clear. Injury to, or alteration of, the central nervous system (fall, hydrocephalus, difficult labor) was often associated with the beginning of the malady. In 3 cases continuous overfeeding with sugar preceded onset. The more common symptoms were increased thirst and hunger, loss of weight, polyuria and glycosuria: acidosis and coma occasionally ended the scene. The prognosis is not necessarily hopeless. Treatment is on the adult lines, the calorific requirements of diet being furnished by fats and proteids. Oatmeal gruel should be given for a day at frequent intervals. In several cases the stiffness of the napkins after drying first drew attention to the urine —*Universal Medical Record.*

THE PHILADELPHIA PEDIATRIC SOCIETY.

November 10, 1914.

W. N. Bradley, M.D., President.

PNEUMOCOCCUS INFECTION AND IMMUNITY.

Rufus I. Cole, M.D., Director of the Hospital of the Rockefeller Institute, delivered, by invitation, the Frederick A. Packard Lecture. The following is an abstract of this:—

Most of the cases of acute lobar pneumonia occurring in all parts of the world are apparently caused by diplococcus pneumoniæ. Certain observations, however, indicate that all these cases that are apparently due to pneumococci do not have an identical etiology. Certain ones are due to pneumococcus mucosus, first described by Schottmüller as streptococcus mucosus. Moreover, on the basis of immunological differences, it is possible to classify the other pneumococci in three groups. In two of these groups, which we have numbered Types I. and II., have been placed organisms having immunological characters peculiar to the respective group. All the organisms belonging to Type I., for instance, are agglutinated by a serum produced by the immunization of an animal to any one of them, and such an immune serum also protects mice against any one of the group. In Group III. are placed all the organisms of the pneumococcus mucosus type. These organisms are not agglutinable, and an immune serum does not protect mice against them. In addition to the organisms belonging in these three groups, however, there are a number of organisms which have no common immunological characters; each one appears distinct. These organisms have been grouped together as Group IV., or Type IV.

Cultures received from Professor Neufeld in Germany indicate that the same types of organism are prevalent in Germany as are found here, and studies made by means of our immune serum by Dr. Walker in Boston, and Dr. Lewis in Philadelphia, indicate that similar organisms are found in the cases of pneumonia in these cities. In 150 cases in which the type of organism causing the disease was determined, 38 per cent. proved to be due to organisms of Type I., 30 per cent. due to organisms of Type II., 11 per cent. due to organisms of Type III., and 21 per cent. to organisms of Type IV. About the same relative frequency of occurrence of the different types has been found in Philadelphia by Dr. Lewis. Aside from the organisms of Type III. there are no constant fixed morphological or cultural characters peculiar to the different types. The clinical manifestations of infection due to these different types, however, are not identical, certainly as regards severity. Among 103 cases not receiving specific treatment the mortality among those due to organisms of Type I. was 25 per cent.; among those due to organisms of Type II., 32 per cent.; among those due to organisms of Type III., 47 per cent., and among those due to Type IV., 6 per cent. From the standpoint of prognosis alone, therefore, the determination of type of infection in the individual case is of considerable importance. The conditions in pneumonia are only different in degree from those found in typhoid fever and dysentery where infections due to organisms of different types occur.

Studies made by Dochez indicate that the type of organism commonly found in normal mouths is that which we have called Type IV. In two instances, however, in the mouths of persons very closely associated with pneumonia patients, pneumococci of the fixed types have been present. Dr. Lyall has shown that the pneumococci commonly present in the mouths of patients suffering from tuberculosis are also of Group IV., and in only two or three instances were pneumococci of the fixed types present. In the mouths of patients convalescing from pneumonia, pneumococci of the fixed types usually disappear within a few weeks after crisis, and are replaced by organisms of the fourth group.

These studies indicate that it may be justifiable to consider all persons having pneumococci of the fixed types in the mouth as carriers of infection. The facts, however, are still too few to justify conclusions as to the best practical measures to be taken for the prevention of pneumonia. Certain observers have apparently observed the transformation of one type of pneumococcus into another, even pneumococci into streptococci, and *vice versa.* In our own personal experience, however, we have not seen such a transformation of one type into another. A study by Dr. Chickering of the agglutinins present in the blood of patients suffering from pneumonia also indicates that the type of organisms in any given case does not change—certainly after the infection has actually commenced. Until the evidence in regard to transformation is more definite, it does not seem necessary to take it into too serious account in our consideration of the epidemiology of pneumonia.

Intoxication.—It has so far been impossible to detect by chemical or biological means the presence of poisons, either in the media in which pneumococci have been cultivated, or in the body fluids of animals dying from infection with these organisms. Lately considerable stress has been laid on the importance of bacterial anaphylatoxins, as described by Friedberger, in producing the symptoms of infection. The anaphylatoxin theory assumed that the intoxication is due to split products of the bacterial protein. According to Friedberger, the ferment causing the splitting is supposed to be present in the serum, but the demonstration by Neufeld and Dold, and also by Rosenow, that autolyzed bacteria, in the absence of serum, are toxic, has required that the theory be modified so as to presuppose that the ferments are present in the bacterial bodies. We have been able to show, however, that the bacteria simply dissolved in dilute solutions of bile, or even brought into solution by freezing and grinding, are also toxic. Since in the latter experiment digestive processes can with all probability be excluded, it seems reasonable to believe that the toxic effects produced by these various solutions are due to preformed substances within the bacterial cells, which are set free when the bacteria go into solution. We have also shown that such solutions of bacterial cells are hemolytic. By immunization of animals it has been possible to produce a serum which neutralizes the hemolytic effects of the toxin, but, so far, it has been impossible to obtain a serum which neutralizes the toxic effects.

The evidence is still very inconclusive, however, that either one of these reactions is of significance so far as intoxication in lobar pneumonia is concerned. The experimental evidence indicates that the symptoms are due to the action of the living bacteria, rather than to the action of substances contained within the dead bacterial cells. Pneumococci, when growing in blood-containing medium, or when growing within the animal body, are able to transform oxyhemoglobin into methemoglobin. An analytic study of this reaction has suggested a possible way in which pneumococci may produce their effects, without the production of a soluble poison. This study indicates that the transformation of oxyhemoglobin into methemoglobin is due to a modification of oxidation and reduction processes in the medium immediately surrounding the bacteria. If this be true, it is possible that an analogous reaction may be responsible for the toxic action of pneumococci on tissue cells. A difficulty, however, arises in applying this theory to pneumonia, since early in the disease there is apparently no wide distribution of the organisms. It is conceivable that in the early stages the symptoms are non-specific in character, and only in the later stages of the disease, when the pneumococci are widespread throughout the body, is the intoxication truly specific in nature.

In the last analysis, however, the exact nature of the intoxication in pneumonia is still obscure.

Method of Specific Treatment.—The method of specific treatment of bacterial infection for which there exists, at present, the best experimental justification is by means of specific immune serum, passive immunization. The diseases in which the best results from this form of treatment have been obtained are diphtheria and tetanus. The serum employed in these diseases is antitoxic. It is for this reason that we have made such great efforts to determine the nature of the intoxication in this disease. In spite of the fact that the evidence is not very convincing that the toxic substances isolated by solution of the bacterial cells play any great rôle in pneumonia, we have, nevertheless, attempted to produce immune serum to such substances. As previously stated, however, such an immune serum has very slight antitoxic power, as tested in guinea pigs, and it has also been found to have only slight protective action when injected together with living organisms. The efforts, therefore, to produce an antitoxic serum which would be of use in the treatment of this disease have so far been unavailing. On the other hand, that it is possible to produce immune sera having high protective power against pneumococci by the injection of repeated increasing doses of the living bacteria has been known for a long time. Immune sera produced in this way have, in fact, been largely employed in the past in the treatment of pneumonia, but the clinical results obtained have not justified their continued extended employment. Further experimental studies, however, have disclosed several probable reasons why such immune serum has been of little or no value. In the first place, a pneumococcus immune serum is effective only against the type of organism used in the process of immunization. If the infection is due to an organism of Type I., for instance, only an immune serum produced by the injection of organisms of Type I. will be of any value. In order to render an antipneumococcus serum useful in any type of pneumonia, it would be necessary, first, to produce a serum with high protective power against the type of organism concerned; second, to have a satisfactory method of standardization of such serum, and, lastly, to have a method for quickly determining the type of organism in each individual case. These conditions have now been satisfactorily met, as far as organisms of Type I. and Type II. are concerned. As regards organisms of Type III., while high active immunity can be produced against them, the serum of such actively immunized animals is entirely without power of preventing infection of other animals. As before stated, each organism of Group IV. seems to be absolutely distinct, so that serum treatment of cases due to this type of organism is practically impossible.

There are two additional reasons why the employment of immune serum as it was carried out in the past was not likely to produce favorable results. First, it was not used in sufficiently large amounts, and, second, its employment was generally made too late in the disease. On the basis of experimental evidence so far obtained, it seems that if treatment be given in large amounts, and not too late in the disease, the use of immune serum against organisms of Types I. and II. should be useful in the cases of pneumonia due to these types of organisms. It has been found possible to produce a serum of great protective power against organisms of Type I. and Type II. In the clinical studies so far carried out, the serum treatment of cases due to organisms of Type I. has yielded more promising results than the serum treatment of cases due to organisms of Type II. Judgment as to the value of the serum has not been based on mortality statistics alone, but the following two facts are considered as evidence of the value of the serum: First, where the blood cultures have been positive before beginning treatment, after one dose of serum, and before the second was given, cultures from the blood have been sterile. Second, it has been found that in the treated cases the appearance of immune substances in the blood occurs much earlier than it does when no such specific treatment has been administered. While the employment of large doses of serum such as we have used is usually followed by so-called serum sickness, this, in future, will undoubtedly be avoided to a large extent by the employment of concentrated serum.

Stress has been laid on the work carried on in the hope of finding a rational basis for serum-therapy, rather than on the actual practical results already obtained. It is only by discover-ing the underlying principles that we can hope to obtain satisfactory measures for combating this terrible infection. We can only hope that careful experimental studies have given us justification for the employment of immune serum in the way I have mentioned, and that the practical results on a large series of cases may confirm the conclusions drawn, and the results already obtained.

A FATAL ILLNESS ASSOCIATED WITH ACUTE INTERSTITIAL PAROTITIS.—M. H. Gordon (*Lancet*, August 2, 1913) presents a communication based upon the histological observation of an unusual lesion—parotitis—in a series of 4 cases under observation in the postmortem room at St. Bartholomew's Hospital during the past few months. All of the patients were children. All had died after a short illness in which the symptoms pointed to meningoencephalitis. Postmortem, meningeal congestion was found in all the cases, and in 2 of them there were flattening of the convolutions and other evidence of increased intracranial pressure. In all alike no pus was present in the meninges. There was no evidence of tubercle in the meninges, brain, or elsewhere. The cerebrospinal fluid was clear and contained an excess of lymphocytes, but no visible bacteria. Sections of the cerebral cortex and of the cord failed on microscopic examination to yield histological evidence sufficient to justify a diagnosis of poliomyelitis. As regards the rest of the body, the lymphatic glands both in the neck and mesentery were swollen. In 2 cases the lymphoid tissue in the small intestine was more prominent than usual, this change being most marked in Peyer's patches in 1 case and in the solitary follicles in the other. In 2 of the cases petechial hemorrhages were seen; in the first in the parietal pleura and visceral pericardium, and in the second on the under surface of the liver and beneath the capsule of the kidneys. In all the children both heart's blood and cerebrospinal fluid had failed to show growth on agar, and their illness would have remained a mystery had it not been for the following observation. Although the salivary glands were not obviously enlarged and had given rise to no symptoms, they were found in all the 4 children to show on histological examination foci of acute inflammation—chiefly interstitial in distribution. There arises a presumption that these children met their death as the result of the unusual action of the virus of mumps, and this is the view to which the author inclines.—*Medical Record.*

CURRENT LITERATURE

ABSTRACTS IN THIS NUMBER BY

DR. CHARLES E. FARR.	DR. HAROLD R. MIXSELL.
DR. R. S. HAYNES.	DR. RUDOLPH DURYEA MOFFETT.
DR. WILLIAM LYON.	DR. WILLARD S. PARKER.
DR. C. D. MARTINETTI.	DR. MARK S. REUBEN.
DR. STAFFORD MCLEAN.	DR. MILLS STURTEVANT.

DR. J. HERBERT YOUNG.

INFANT FEEDING.

BRODSKY, CH.: OBSERVATIONS ON THE LACTATION OF WET NURSES. (*Archiv. für Kinderhk.*, July, 1914, pp. 161-199.)

Budin was among the first to show that a wet nurse may be able to nurse not only her own infant, but also several others, and that a breast may be stimulated to secrete much more milk by the application to it of several robust infants; and this he was able to accomplish in one case thirty-four days postpartum, although there had been no lactation in the interim.

Schlossmann has reported that 80 per cent. of the wet nurses under his observation who had been at the hospital longer than eight days could produce more than 800 g. breast milk, 10 per cent. more than 2 L., and 4 per cent. more than 3 L. The greatest amount produced was 4,670 g. by a wet nurse who produced on the average for thirteen months 3,188 g. milk daily. According to Finkelstein, a good wet nurse produces on the average 1,100-1,300 g. daily; more than one-third of his wet nurses could produce between 2,000-2,500 g. daily; exceptionally the daily quantity amounted to 3, 3½ and 4 L.

The milk secretion is excited by a reflex; the stimulus of the reflex is the nursing act; the more energetic and the more frequent is the nursing the richer is the milk secretion; this amount can be enriched if the breasts are artificially completely emptied after nursing. Helbich has shown that in certain cases the milk secretion may be maintained for months through the artificial emptying of the breasts with the pump, where there is no infant nursing. One of his wet nurses was in this way able to produce from 2,200-2,300 g. milk daily for several months.

As for the duration of lactation, Engel is of the opinion "that as long as the nursing act is carried out, so long the secretion of milk *usually* keeps up." Schlossmann and Finkelstein are of the same opinion. The observations of Ploss on Hottentots bear this point out, many of whom, as grandmothers, nurse their grandchildren. Finkelstein has never seen a spontaneous retrogression of milk secretion, not even in wet nurses who have nursed infants for six to twelve months and longer. One wet nurse produced 1,500 g. milk daily at the end of nineteen months of continuous nursing, and another at the end of twenty-five months was able to produce 1,700 g. daily.

As to the effect of menstruation on lactation, there is great diversity of opinion. Finkelstein is of the opinion that it has no influence on a rich secretion during the later stages of secretion; only where the milk secretion is not plentiful and in the early stages of lactation can it have a deleterious effect.

The author presents a study of seventeen wet nurses; in every case the breasts were completely emptied after nursing; the wet nurses were on the average about twenty-five years old (nineteen and one-half to thirty-five); they were employed at the hospital from 42-486 days; the total amount of milk produced varied from 43,767 L. in 42 days to 1,193,279 L. in 339 days; the proportion of milk removed artificially to that nursed was from 3.4 per cent.-46.9 per cent.; the daily average of milk produced was from 577 g. for 70 days to 3,520 g. for 339 days; the highest daily quantity produced was 5,400 g. MARK S. REUBEN.

MEDICINE.

WILLIAMS, ANNA WESSELS: A STUDY OF TRACHOMA AND ALLIED CONDITIONS IN THE PUBLIC SCHOOL CHILDREN OF NEW YORK CITY. (*The Journal of Infectious Diseases,* March, 1914, p. 261.)

This is a symposium on trachoma and allied conditions by a group of workers under the direction of Anna Wessels Williams, and consists of the following heads: (1) Introduction and Critical Review of the Literature. (2) Diagnosis and Course of 4,000 Cases of Conjunctival Affections, Including Trachoma and Allied Conditions. (3) Prophylactic Treatment of Trachoma and Allied Conditions in New York City School Children. (4) Curative Treatment, Including Vaccine Treatment of Infectious Eye Diseases. (5) Microscopic and Cultural Studies. (6) Discussion, summary and conclusions.

Under heading six the following facts are advanced as a summary: (1) The written descriptions of trachoma do not agree as to a clinical or a pathologic entity. (2) Among the children of sixty public schools in the crowded lower East Side of New York City (supposed to be a hotbed of trachoma) during the past four years we have found no cases of conjunctival affections answering in their entirety to the classic descriptions of trachoma. (3) None of the 3,000 and more cases of follicular affections in these children have developed cicatricial changes due to infection; on the contrary, the great majority of them now present normal conjunctivæ. We attribute these results chiefly to the following measures: (*a*) The carrying out of preventive methods of treatment, such as ophthalmia schools and school clinics, summer camps, mothers' demonstration classes, home instruction, and "follow-up" work. (*b*) More minute care of acute as well as chronic cases, including the specific treatment given chiefly at clinics and the follow-up work in the homes. (*c*) Non-operative procedures in a large number of cases formerly operated upon. (4) Hemoglobinophilic bacilli are found in a large proportion of the cases of chronic conjunctivitis (especially of the papillary type) as well as in those of acute catarrhal conjunctivitis (including clinically typical "pink eye"). (5) These bacilli, though they probably represent several different varieties, have not yet been differentiated from B. Influenzæ. (6) These bacilli are found coincidently with trachoma inclusions in a high percentage of the cases of subacute and chronic conjunctivitis when examined from the beginning. (7) These bacilli show morphologic and staining characteristics similar to those seen in trachoma inclusions; and transition forms between bacilli and inclusions are frequently seen in these cases. (8) In a few cases of acute catarrhal conjunctivitis, trachoma inclusions and transition forms have been found coincidently with hemoglobinophilic bacilli and in several other acute cases transition forms have been often found. (9) Many of the cases of chronic papillary conjunctivitis not actually followed from the beginning by us give a history of repeated acute attacks, and several cases beginning with us as acute contagious conjunctivitis passed into the chronic condition called papillary conjunctivitis. (10) Cell inclusions similar to the trachoma inclusions found in the papillary conjunctivitis cases are found in cases of gonorrheal ophthalmia neonatorum, cultures from which show only gonococci. These inclusions differ somewhat from those found in the papillary conjunctivitis cases, and transition forms between gonococci and inclusions are seen in smears from the former cases. (11) Members of the pneumostreptococcus group are frequently found in chronic as well as in acute cases, especially in those cases showing pannus.

The following conclusions are drawn:—

(1) Trachoma inclusions are nests of growing bacteria in epithelial cells—hemoglobinophilic bacilli in certain cases of papillary conjunctivitis, gonococci in certain cases of gonorrheal conjunctivitis and possibly other bacteria in certain other cases of conjunctivitis.

(2) Under minute hygienic and medicinal treatment the great majority, if not all, of the cases of conjunctival affections of children may run a benign course, resulting in normal conjunctivæ.

(3) Comparatively few, if any, cases of chronic conjunctivitis develop in individuals exposed if the rules of general and personal hygiene are carried out.

(4) If trachoma is present, or should be introduced among our school children, it may be controlled by methods which are within practical limits. HAROLD R. MIXSELL.

VIGEVANI, F.: SUBACUTE CEREBROSPINAL MENINGITIS. (*Il Morgagni,* 1913, No. 11.)

The examination of the spinal fluid in a case of cerebrospinal meningitis revealed Fraënkel's diplococcus. Patient was a woman whose husband also presented a light form of the disease. After a close study of the 2 cases Vigevani admits the possibility of identity between the diplococcus Fraënkel and that of Weichselbaum. Prognosis in any case is reserved.

C. D. MARTINETTI.

PARRISH, JOHN W.: TYPHOID FEVER IN INFANCY. (*Long Island Medical Journal,* November, 1914, p. 410.)

Parrish cites 2 cases in full. The first, fourteen months, with two members in the same family similarly affected. Onset with cough, fever and vomitus; temperature ranged for five days between 104° and 105.2°, with vomitus and diarrhea. Death on eighth day. Widal positive. Second case, aged two months; 3 other children in same family ill with typhoid; positive

Widal; temperature ranged from 102° to 103.4°. Death on thirty-fourth day. He quotes several authors, among them Morse, who collected 16 congenital cases; diagnosis confirmed by autopsy or cultures, 10 of whom were stillborn, others died either immediately or up to three weeks after birth. Only 1 showed intestinal lesions. He quotes Holt, Northrup and Kerley, who comment on the rarity of the disease under two years of age.

STAFFORD MCLEAN.

BRYANT, JOHN: POOR HEALTH IN THE CHILD. SOME DEVELOPMENTAL INFLUENCES AND THEIR IMPORTANCE TO THE ADULT. (*Boston Medical and Surgical Journal,* 1914, p. 795.)

What per cent. of ptoses, adhesions and other abnormalities of the adult are congenital? What is their influence upon health. The author has put in some two years' work in studying autopsy and clinical material and here presents a preliminary note. All interested in improving the health of the child should read the original article. The following conclusions are reached: (1) Adhesions, ptoses and other demonstrable physical defects are of very common occurrence at all ages in both sexes, but the frequency of these defects in the adult is not markedly greater than in the child. (2) It is not improbable that such defects may stand in a causal relation to some at least of the disabilities of the child and the adult. (3) An anomalous ligament of Treitz may be a factor in obstruction of the duodenum. (4) A simple double measurement of the thorax is presented which is likely to prove an aid in the recognition of certain intra-abdominal abnormalities. This measurement is in a variable degree an indicator of physical efficiency and is useful after the age of five years. (5) The treatment of developmental defects is primarily non-surgical and if properly carried out in the child is preventive in that it will result in creating an adult not only more efficient, but one who may have physically more perfect children.

WILLARD S. PARKER.

BINNIE, H. A.: ORTHOSTATIC ALBUMINURIA. (*The Woman's Medical Journal,* November, 1914, p. 221.)

In this condition, which occurs in young adults and children of both sexes, most commonly at the age of puberty, ten minutes in vertical position is enough to cause albumin to appear in the urine. Common in poorly-developed types with symptoms of neurasthenia. Binnie divides these children into three types (after Langstein): (1) Angiospastic, (2) erethic type, (3) type in which albumin is the only symptom. Urinalysis proves urine free from albumin in the morning and present when child is up and about, regardless whether exercise is taken or not. Rarely hyalin casts are found. Specific gravity is usually 1,021. Chlorides in excess and a positive acetic acid reaction for *eglobin.* The amount of albumin is hardly, if any, affected by protein intake. Treatment consists in general measures to develop the general constitution of the child. STAFFORD MCLEAN.

BONAZZI, C.: STUDY OF EPIDEMIC OF MUMPS. (*Boll. Sc. Med.,* August, 1913.)

Bonazzi advances the theory that the germ causing epidemic parotitis may penetrate through tiny cracks and lesions of the epidermis. Such openings would easily be found in chapped skin in the winter. Prophylactic measures could easily be taken.

C. D. MARTINETTI.

WARFIELD, LOUIS M.: FURTHER OBSERVATIONS ON DIASTOLIC AND PULSE PRESSURE. (*American Journal of Medical Sciences,* December, 1914, p. 880.)

Warfield again asserts the greater exactitude of taking the change from the third to the fourth sound as the point of diastolic pressure by the auscultation method rather than the cessation of sound. He points out that in aortic regurgitation the dull fourth sound will persist even until the mercury or needle comes to zero, while manifestly the diastolic pressure, which represents the peripheral resistance, must have a greater value than this. The pulse pressure, which represents the actual propulsive force of the heart, has not been sufficiently emphasized. It is very valuable.

Warfield mentions the work of Voegtlin and Macht, who have isolated a crystalline substance from the blood which they think the cause of the constriction of the peripheral blood vessels which lies back of hypertension.

The normal pulse pressure, according to Warfield, should be 40 to 45 mm. Hg. In myocardial disease, it may be as high as 70 or as low as 15, with an average of 40 mm. Hg. In this affection it may be normal to within a few minutes of death. In chronic nephritis the pulse pressure in 75 cases was 62 mm. Hg.

average. The highest in this group was 130 mm. The most consistent low pressures were found in advanced cases of pulmonary tuberculosis and late typhoid fever.

Warfield regards as low all pulse pressures below 30 and high any above 50 mm. Hg. With normal systolic pressure, high pulse pressure signifies peripheral dilatation; decreasing pulse pressure means cardiac failure. With high systolic pressure, high pulse pressure has little significance; decreased or even normal pulse pressure means peripheral constriction and is therefore an unfavorable sign. With low systolic pressure, increased pulse pressure occurs only in aortic insufficiency; decreased pulse pressure usually means general cardiac weakness as seen in convalescence from long illnesses or in cachexia of malignant disease.

R. S. HAYNES.

BODENHEIMER, J. M.: PURPURA HEMORRHAGICA TREATED WITH HORSE-SERUM. (*New York State Medical Journal,* October 10, 1914.)

Bodenheimer's case was in a female child and presented the classical symptoms of purpura with hemorrhagic blisters in the mouth, blood in the stools and the vomitus. Calcium lactate, 2 grains every two hours, with gelatin and orange juice, were administered by mouth, but the main reliance was in the intramuscular administration of horse-serum in 10 c.c. dose, repeated once at the end of two days. Immediate improvement was noted in the epistaxis and the hemorrhagic blisters in the mouth healed as by magic, but the bloody stools continued another day or so. No ill effects were observed, except an annoying urticaria. The child progressed to an uninterrupted and complete recovery.

CHARLES E. FARR.

HEIMAN, HENRY: A VALUABLE DIAGNOSTIC AND PROGNOSTIC SIGN IN CHOREA OF CHILDREN. (*Archives of Diagnosis,* April, 1914.)

This sign may be demonstrated in the earliest stage of chorea before visible manifestations appear, and is produced in the following manner: The palm of the patient's left hand is placed upon the palmar surface of the observer's right hand. Then the thumb of the patient is embraced by the index and middle fingers of the physician and the other four fingers firmly grasped by the remaining fingers of the examiner. The right hand of the patient is similarly grasped by the left hand of the physician. The attention of the patient is then invited by asking him a simple question; for instance, his name, age, address, etc., at the same time having him look directly into the eyes of the examiner. If the patient has chorea the twitching of the hands will be distinctly augmented each time his attention is engaged by the mental concentration required to answer a question. The firmer grasp the observer has upon the patient, and the more he is able to disengage the patient's attention from the examination, the more surely will he be able to discern the finer muscular twitchings indicative of the early stage of chorea.

HAROLD R. MIXSELL.

RIST, E.: THE HEALING PROCESS OF THE INFANTILE BRONCHIAL GLAND TUBERCULOSIS. (*Edinburgh Medical Journal,* September, 1914, p. 215.)

Enlargement and caseation of the bronchial and mediastinal glands, the most conspicuous morbid change observed in children is always caused by and consecutive to an initial tuberculous lesion in the lung itself. The pulmonary focus is often so small that, postmortem, it can only be detected after a most painstaking investigation. The majority of these children whose bronchial and mediastinal glands are tuberculous recover and grow up to be the average healthy adult. Yet, among those who recover, an important percentage are re-infected later on, and become the young or adult consumptive. The differences between the lesions of the bronchial glands in the child and the adult are very striking. In the adult, bronchial glands of normal size or hardly enlarged, are found coincident with extensive tuberculosis of the lung. In 400 adult cases of pulmonary tuberculosis, caseation of the bronchial glands was found in only 3 cases and they were young individuals. Scars of healed tuberculous lesions are to be found in a small number of glands in each adult case, and they occupy a part only of the gland, the rest of which is sound or nearly sound, and reacts normally to disease affecting the lung territory to which it corresponds. The comparative study of glands at different stages of the healing process shows that this scar tissue is formed by bundles from the peripheral fibroid tissue penetrating the central caseous mass. During this healing process, which requires a long time, the tuberculous follicular formations, which are a characteristic feature of the peripheral fibroid part of the caseous gland, gradually disappear. Rist concludes that caseation of the bronchial glands is not a specific character of childhood, but of primary tuberculous infection. If, on the other hand pulmonary tuberculosis of the adult is, as a rule, not accompanied by caseation of the corresponding bronchial glands, it is not because the lymph glands of the adult are essentially and physiologically different from those of the child, but simply because pulmonary tuberculosis of the adult is due to a *re*-infection.

J. HERBERT YOUNG.

VON PIRQUET, C.: BRONCHOGENEOUS, PLACENTOGENEOUS, DERMATOGENEOUS, AND ENTEROGENEOUS INFECTION, WITH TUBERCULOSIS IN INFANCY. (*Edinburgh Medical Journal,* September, 1914, p. 220.)

In the first year of life the bronchogeneous infection with tuberculosis is by far the most frequent way of entry (about 95 per cent. of all infections). The primary infection of the intestinal canal (enterogeneous infection) is uncommon—1 per cent. to 2 per cent. of all infections. Intestinal tuberculosis in infants is, as a rule, secondary and due to the deglutition of tuberculous mucus which comes from the lungs. These figures are much lower than those given by English and American observers. The difference may be due in part to the fact that in Vienna the milk is usually boiled. A placentogeneous infection of the fetus is a rarity, as is also stomatogeneous and dermatogeneous infections. Prophylaxis of infant tuberculosis has chiefly to deal with the separation of the nursling from the coughing adults.

J. HERBERT YOUNG.

STOLL, HENRY F.: THE LATE MANIFESTATIONS OF INHERITED SYPHILIS. (*Journal of American Medical Association,* October 31, 1914, p. 1,558.)

Stoll made a very careful study of inherited syphilis in 68 individuals from 32 families. In the vast majority of the cases there were few or none of the familiar signs of congenital disease (pegged teeth, corneal opacities, etc.), but careful histories led to a suspicion only of the true condition. In some of the cases the disease was present in the third generation, the parents being innocent. The studies were corroborated by careful Wassermann and luetin tests, the latter proving by far the more efficient in detecting latent disease. Stoll concludes in part as follows: (1) Syphilis is a family disease; rarely is the patient the only one infected. (2) Over half of the children born of syphilitic parents and surviving infancy give a positive reaction to luetin; over 90 per cent. of those with obvious ailment give positive reactions to one or the other test. (3) There is often nothing in the appearance to suggest lues and the symptoms are often indefinite and misleading. (4) Too much stress cannot be placed on the importance of a complete family history in every obscure case. (5) It seems probable that syphilis may be transmitted to the third generation. (6) Some cases of neurasthenia are due to congenital lues and can be cured by specific treatment. (7) Syphilis seems to be an etiologic factor in certain of the families prone to heart and arterial disease. (8) Hypertension in middle life may be due to congenital dues. (9) Both a Wassermann and a luetin test should be employed, as neither is infallible, the Wassermann being frequently negative in syphilis hereditaria tarda, the luetin occasionally so. Charles E. Farr.

Fleischmann, Dr. Otto, and Wolff, Dr. Siegfried: Congenital Anasarca. (*Archiv. für Kinderhk.*, November, 1913.)

The infant was born blue and asphyxiated. Hemorrhagic spots and general edema (especially around the eyes) were present at birth. Puncture of the abdomen was performed and 200 c.c. of reddish yellow fluid was withdrawn. Shultz movements were carried out and the infant began to breathe. The ascitic fluid had a specific gravity of 1,012 and 16 per cent. albumin; Weber's blood reaction was strongly positive, and in the sediment isolated erythrocytes were found.

The mother was tuberculous and gave a strongly positive Wassermann reaction. She had given birth to 3 children—the first, a prematurely born infant, died shortly after birth; the second died two days after birth; the third was stillborn.

The patient had marked edema of head, back, arms and legs; very marked edema of eyelids was present; hemorrhagic spots in size from the head of a needle to a pea were present over the whole skin. Petechiæ were also present on the hard palate. No glandular enlargement; no paronychiæ; pupils react to light; patellar reflex exaggerated; no masseter reflex; breathing superficial and rapid; coarse râles heard over both lungs; hypospadias and general edema of scrotum; abdomen flat and distended; liver enlarged; spleen not palpable; temperature subnormal. Blood examination showed: Hemoglobin, 35 per cent.; red blood cells, 2,600,000; white blood cells, 9,100; many normoblasts and myelocytes were present. The child died twenty-four hours after birth.

On autopsy there were found 150 c.c. more of reddish yellow fluid; pleuræ were not involved; piedema and slight hydrocephalus were present; the brain was very soft and edematous. All the serous membranes were covered with hemorrhagic spots. They consider this case of great interest on account of the association of the general edema with the hemorrhagic tendency. In all the other cases of general anasarca in infancy hemorrhages did not play an important part in the symptom-complex present.

MARK S. REUBEN.

LEO-WOLF, CARL G.: THE DIETETIC TREATMENT OF CHILDREN DURING THE SECOND PERIOD OF LIFE. (*Medical Record*, October 14, 1914, p. 624.)

At the time of weaning the author adheres to the system of five feedings daily at four hour intervals with nothing at night. As soon as possible he leaves out the afternoon meal, the one corresponding to afternoon tea, and later also the second breakfast, so that the child gets one-quarter each of its daily allowance at breakfast and supper and one-half at dinner, the heaviest meal coming in the middle of the day, followed by a nap. Thirty calories per pound is required by the child during the second year. Milk as the exclusive, or even the principal, food is bad, but it is a valuable addition to the child's dietary, strong broth and beef tea are stimulants and as such have no more place in the dietary of the healthy child than has alcohol. Vegetables best for this age are spinach, carrots, lettuce, potatoes, Spanish chestnuts; of the fruits, apples, pears, oranges and bananas. The author also is a great believer in dried beans, peas and lentils, and also soybean flour. As these are given principally for their salts it is important to use the water in which they have been boiled for straining purposes. For the teeth, dry toast, zwieback, Holland rusk, crackers and graham wafers. During the next two years egg or minced meat is added, also the coarser vegetables, such as cabbage, cauliflower, parsnips, turnips and asparagus. Of the fruits, those with pits and the berries with the seeds strained out. The child may now get bread, ordinary toast and rolls. After the age of four the child may eat at the family table, but must be carefully watched. The daily allowance of milk may be still further cut down. HAROLD R. MIXSELL.

SOLIS-COHEN, MYER: THE SUBJECTIVE AND OBJECTIVE SYMPTOMS OF FAVORABLE AND UNFAVORABLE REACTIONS TO TUBERCULIN. (*Medical Record,* October 31, 1914, p. 756.)

The author distinguishes between favorable and unfavorable reactions to tuberculin and groups the symptoms under these two general heads. A favorable reaction means that the dosage is correct, while a moderate or marked unfavorable reaction means that the dose is excessive. No reaction is looked upon as the sign of an insufficient dose. In all he cites ninety-eight distinct symptoms, many of which have not previously been recorded. Seventy-one patients reacting to tuberculin were used. As a compendium of symptoms the article is valuable.

HAROLD R. MIXSELL.

THERAPEUTICS.

GOODALE, J. L.: PRELIMINARY NOTES ON ANAPHYLACTIC SKIN REACTIONS EXCITED IN HAY-FEVER SUBJECTS BY POLLEN OF VARIOUS SPECIES OF PLANTS. (*Boston Medical and Surgical Journal,* November 5, 1914, p. 695.)

In June, 1914, Goodale called attention to the value of the skin reaction in the recognition of a state of sensitization to horse serum and showed the typical wheal-like local reaction to serum applied to the scarified skin. Since then 58 cases of hay fever have been examined and the skin test applied with extracts made from pollens. Forty-five cases were examined with reference to grasses. It was observed that in all cases reacting positively the red top, timothy and blue grass equally excited reactions. Of these cases 8 reacted to grasses alone; 13 were positive to grass and ragweed alone; 6 cases showed positive reactions toward grasses, ragweed and golden-rod and a variety of other plants; 3 cases were positive to grasses and roses alone. Beach grass was tested in 27 cases and found positive in 11. Ragweed was tested in 49 cases, 45 being positive, 4 negative; 13 were positive to ragweed alone, no other pollens exciting reactions; 16 were positive to both ragweed and golden-rod, negative to all other plants. Forty-nine were tested for golden-rod; 26 were positive, 23 negative. Only 1 case was positive to golden-rod alone. A large number of other pollens were tried and a moderate number of positive reactions obtained.

WILLARD S. PARKER.

FIORE, G.: SALVARSAN IN CHOREA. (*Il Morgagni,* 1913, No. 34.)

After reviewing at length the advantages following the administration of salvarsan in Sydenham's chorea, the writer declares that the beneficial effects are only due to the arsenic contained in the remedy. He does not agree with Meliam in considering chorea a syphilitic manifestation localized in the nervous system. Injections of salvarsan rapidly cure serious cases of chorea but this is not sufficient to prove a relation between the two diseases.

C. D. MARTINETTI.

VON HOFMANN, KARL RITTER: PROGRESS IN THE TREATMENT OF GONORRHEA WITH SPECIAL REFERENCE TO VACCINE THERAPY. (*The Urologic and Cutaneous Review,* October, 1914, p. 513.)

After a careful study and long observation of vaccine therapy in the treatment of gonorrhea, Von Hofmann gives us his results. This article is of interest to all pediatrists because of the frequency of gonorrhea in children. He prepared vaccine from various strains of gonococci and killed them by sterilization for one hour at 62°C. The later vaccine which he used was prepared at the Vienna Sero-Therapeutic Institute, the gonococci being no longer killed by heat but after collection in sterile water or salt solution they were allowed to die spontaneously. This method was followed so as to do as little harm to the endotoxins as possible. The vaccine, after the determination of the germ content, was diluted and applied with, or without, the addition of phenol. The injection of vaccine was applied intramuscularly in the gluteal region. The dose usually given was from

5,000,000 to 10,000,000 germs per cubic centimeter. A few hours after injection there was a slight rise in temperature with a local reaction, pain and swelling. After from five to seven days another injection was given of a slightly higher dose. If after the first injection there was a strong reaction then after an interval of several days an equal dose, as in the first injection, was given. Von Hofmann has had the same experience as other authors in the use of this method of treatment. He finds that vaccines have no influence upon the inflammatory process in the urethra, and that, on the contrary, there may be an increase in the local symptoms. He says that vaccine therapy appears to influence only the complications of gonorrhea. This is especially the case in gonorrheal arthritis and epididymitis. RULOLPH DURYEA MOFFETT.

MCWALTER, JAS. C.: ANTIMONY IN SYPHILIS. (*Medical Press and Circular,* October 28, 1914, p. 448.)

McWalter quotes from Neisser drugs which kill spirochetes, namely, mercury, arsenical compounds, which include salvarsan and antimony. Neisser thinks a combination of mercury, arsenic and antimony would be ideal. Some spirochetes are affected by the compounds in different ways. The treponemes must not only be killed, but blood made unfavorable for their reproduction. The author has used antimony extensively for years without fatal results; useful in skin manifestations, the red sulphide, 2 grains daily, for several months' period with intermissions.

STAFFORD MCLEAN.

VEEDER, J. S., AND JEANS, P. C.: DIAGNOSIS AND TREATMENT OF "LATE" HEREDITARY SYPHILIS. (*American Journal of Diseases of Children,* October 8, 1914.)

In accordance with many other recent investigators Veeder and Jeans find a much greater proportion of hereditary syphilis giving delayed manifestations than was formerly recognized. Lesions of the central nervous system predominate—43 per cent. in their series. Many of the cases presented symptoms of a rheumatic type, such as arthritis, myalgia, chorea, etc., as proved by the Wassermann tests and the marked improvement under antisyphilitic treatment. Many of the cases resist the most intensive and prolonged treatment, although showing marked improvement. It is extremely hard, if not impossible, in the authors' opinion, to attain a permanent negative Wassermann reaction in these delayed cases. Acute symptoms yield fairly readily to intensive treatment, but it is doubtful if a real cure can be attained by any means at present at our disposal. The main reliance must still be placed on mercury, although intravenous neosalvarsan is very helpful in the beginning of treatment.

CHARLES E. FARR.

WEIL, A. I.: THE EFFICACY OF VACCINE IN THE TREATMENT OF CHRONIC DIPHTHERIA CARRIERS. (*New Orleans Medical and Surgical Journal,* November, 1914, p. 432.)

Weil reports 21 cases giving positive culture of diphtheria bacilli. Twelve of these had never had clinical diphtheria; 9 had made a clinical recovery from diphtheria two weeks or more before. He gave stock vaccine of diphtheria bacilli. In ten days 6 cases gave negative cultures. In twenty days six more gave negative cultures. He gave autogenous vaccines to the remaining 9 and found them free from diphtheria bacilli in forty days. He concludes that the vaccines have an influence in clearing the cultures; that the patients give no clinical signs of a general reaction; that large doses are necessary; that six cultures are necessary before a patient can be said to be diphtheria bacillus free.

MILLS STURTEVANT.

RUSSELL, MAJOR F. F.: ANTI-TYPHOID VACCINATION IN CHILDHOOD. (*New York State Journal of Medicine,* July, 1914, p. 346.)

Typhoid is a disease of young persons. One-third of a thousand reported deaths were under twenty years of age. No harmful effects of vaccination and no cases of typhoid in those vaccinated have been reported by the writer. Re-vaccination should be performed more frequently than in adults, the dose being regulated by the weight of the child. The injection should be subcutaneous rather than intramuscular, as the reaction is thus likely to be less, only about 2 per cent. having a moderate or severe reaction. With school children injections are made on Saturday and repeated in one week, thus leaving Sunday to care for any unpleasant reaction. Smaller doses at intervals of four or five days will prove efficacious in those who would have severe reactions with larger dosage.

WILLIAM LYON.

SURGERY.

ADAMS, Z. B.: THE CAUSES AND THEIR RELATION TO THE TREATMENT OF LATERAL CURVATURE OF THE SPINE. (*Boston Medical and Surgical Journal,* May 21, 1914, p. 786.)

At the scoliosis clinic of the Children's Hospital, Boston, the author made a comprehensive study of these cases. Twenty-two cases, consisting of 18 girls and 4 boys, were studied by the X-ray. The following deformities were noted: Deformed third and fourth dorsal vertebra; slipping of seventh or eighth dorsal vertebra; deformity of right inferior articular process; distortion of right superior articular process third lumbar (3 cases); faulty fusion of left inferior articular process of fifth lumbar (5 cases); faulty fusion of left pedicles with body of fifth lumbar; spina bifida of first sacral segment, sacral articular processes asymmetrical (5 cases); overgrowth of right superior articular process of sacrum; absence of neural arches throughout sacrum, its articular processes diminutive; failure of first posterior segments of sacrum, first sacral centrum deformed; faulty fusion of second and third sacral segment on left.

The treatment is discussed and it is shown that some of these cases cannot be corrected until a bony obstacle is removed surgically. Some of them, if corrected, will relapse, unless the defective articular processes are locked together. Scoliosis develops in a great many cases at the age of from ten to fourteen years, the time at which the anterior lumbar curve becomes constant. Fourteen of the 22 cases show a congenital lesion at the lumbosacral junction. WILLARD S. PARKER.

VEEDER, BORDEN S.: DUODENAL ULCERS IN INFANCY. (*The American Journal of the Medical Sciences,* November, 1914, p. 709.)

Five cases are reported by the writer, bringing the total number of cases reported in the literature up to 100, of which 80 per cent. have been reported in the last six years. All 5 cases were under six months of age and "marasmic." The degree of chronic nutritional disorder was out of all proportion to the dietetic fault. There had been no acute gastrointestinal disturbance. Vomiting was present in all and resembled the type occurring in pyloric obstruction. However, the peristaltic waves and tumor were absent. Massive hemorrhage from the bowel was diagnostic when other conditions, as acute ulceration of the large intestine, or polypi, etc., were ruled out. Severe collapse, as a result of the hemorrhage, was generally the cause of death. Prognosis is bad. Surgery offers little owing to the severe general nutritional disorder of the infant at the time the diagnosis was made. If methods are found by which an ulcer can be recognized early, surgical treatment offers at least a theoretical possibility. Pathogenesis is still in a hypothetical state.

HAROLD R. MIXSELL.

ROBERTS, PERCY W.: HYGROMA OF THE GROIN. (*Journal of American Medical Association,* November 21, 1914, p. 1,853.)

Roberts presents a very brief account of one of those rare and interesting growths known as hygromas. His case is especially interesting because of its location in the groin, this being apparently the first case of the sort on record. The patient, a boy of sixteen, presented a growth in the upper and anterior aspects of the right thigh closely resembling a cold abscess. There was a discharging sinus in the region, but it did not communicate with the main swelling, as proved by operation. The findings were typical of hygroma, multilocular cysts with delicate walls and serous contents. Treatment was cureting and cauterization with various chemicals, but one cyst refilled. Healing was much delayed and was finally secured only by the use of the X-ray. The etiology of these growths is very interesting, and it is to be greatly regretted that more careful microscopic examinations were not made.

CHARLES E. FARR.

PHYSIOLOGY.

TAYLOR, WESLEY: PRECOCIOUS MENSTRUATION. (*Detroit Medical Journal,* October, 1914, p. 361.)

Taylor reports 2 cases. The first menstruated at twelve months, again at sixteen months and after a few months' free interval began regular typical menstruation. The child was precocious in disposition and language; resented exposure of the genitals; had some pubic hair and the figure of a girl at puberty. The other case, eighteen months old, had menstruated nearly every month since birth. The figure and breasts were those of a girl at puberty. There were no other signs of precocity.

MILLS STURTEVANT.

BOOK REVIEW

A Doctor's Viewpoint. By John Bessner Huber, A.M., M.D., Editor of *The Dietetic and Hygienic Gazette;* Author of "Consumption and Civilization" (Lippincott's); Fellow of the American Medical Association and of the New York Academy of Medicine, etc., etc. Pp. 164. New York: Gazette Publishing Company, 1914.

These little essays of Dr. Huber's are full of much that is interesting, and they indicate a broad reading and a sure acquaintance with men and affairs. To the layman they will bring more clearly the attitude of an experienced physician toward life in general; to the physician they will refresh sound opinions which he himself may have reached; to all they will afford a pleasant hour of reading. It is too bad that they are not more attractively clothed, and that there are many cases of wrong spelling and some instances of incorrect grammatical construction. But the meat is there.

Infection and Resistance: An Exposition of the Biological Phenomena Underlying the Occurrence of Infection and the Recovery of the Animal Body from Infectious Disease. By Hans Zinsser, M.D., Professor of Bacteriology in the College of Physicians and Surgeons, Columbia University, New York City; Formerly Professor of Bacteriology and Immunity in Stanford University, California. With a chapter on "Colloids and Colloidal Reactions," by Professor Stewart W. Young, Department of Chemistry, Stanford University.

Though in a raindrop the universe may be mirrored, such concentration of capability does not reside within the compass of a book review. It would be impossible to adequately represent the views of Professor Zinsser and the conclusions at which he and Professor Young arrive, for the subject of infection and resistance embraces the results of the labor of thousands of workers in the fields of bacteriology, pathology, serology, immunology, chemistry and physics as well as certain work of clinicians. One can but estimate the earnestness with which the truth has been sought and the skill with which it has been gathered and presented to our minds. To appreciate the details one must read the book and read carefully. We may well quote from the preface: "It is not a good plan to attempt too extensively to simplify material that, in its close analysis, presents complex phenomena and intricate reasoning. . . . No true insight into any branch of medicine, or, for that matter, into any other science, can be attained without a certain amount of labor; however, the concepts of this subject are, indeed, relatively simple after the first principles have been mastered, and the writer has attempted, therefore, . . . to treat the subject critically, separating strictly those data which may be accepted as fact from those in which legitimate differences of opinion prevail."

Seldom have we seen a scientific work so pervaded by the spirit of sincerity and by such clarity of thought; so filled with the evidence of a mind unswervingly subordinating all personal bias in the attempt to reflect only what is assuredly true. As a pleasant surprise comes a fine literary style, foreign to many such works, and this makes for a more delightful reading and an easier understanding.

The publishers have achieved a piece of bookmaking well in keeping with the excellence of the text.

CLINICAL OBSERVATIONS AND EXPERIENCES FROM THE CHILDREN'S HOSPITAL IN FRANKFURT, GERMANY. By GÖTZKY V. METTENHEIMER, M.D., H. F. WEIHE, M.D., and F. WEIHE, M.D. Pp. 120. Berlin: Julius Springer, Publisher, 1914.

During the past two years (1912 to 1914) 2,247 patients were observed by the authors in the new Children's Hospital at Frankfurt. The most interesting and instructive cases are reported, with autopsy findings, in certain cases, and with the author's methods of treatment. Space does not permit a very thorough review of this most interesting work.

In a case of *hemophilia* it is interesting to note that the mother of the patient had a very severe hemorrhage after a miscarriage which nearly ended fatally. This condition has at times been described in females, and is called "a mild form of hemophilia."

A very good description is given of *diseases of the genitourinary tract*. The authors have shown conclusively by autopsy findings that at times it is impossible to make an accurate differential diagnosis between cystitis, pyelocystitis and pyelonephritis.

They are of the opinion that the kidney or the pelvis of the kidney is affected in every case, whether or not casts are found in the urine. Thirty-one patients were observed between the ages of one month and thirteen years, one-third of whom were males. The mortality was about 30 per cent. The colon bacillus was the organism usually found in these cases. *Treatment* consists in giving potassium citrate and hexamethylenamine alternately for a few days at a time. These drugs do not disinfect in the small doses in which they are given, but they offer resistance to the invading organism, and prevent growth. The most important treatment consists in giving large amounts of fluids, by mouth, by rectum, and, if necessary, by infusion. Vaccines as well as bladder irrigations are useless.

Many other interesting cases are reported by the authors. There is nothing new among the observations, but the personal experiences make rather instructive reading.

THE INFANT: NUTRITION AND MANAGEMENT. By ERIC PRITCHARD, M.A., M.D. (Oxon.), M.R.C.P. (London), Physician to the Queen's Hospital for Children, Physician to Out-patients, City of London Hospital for Diseases of the Chest; Honorary Physician for Infant Consultations, St. Marylebone General Dispensary, etc. Pp. 265. New York: Longmans, Green & Co. London: Edwin Arnold, 1914.

This small book has in it a wealth of material and much common sense. Dr. Pritchard has had a great deal of experience with children and has given to the rather neglected first days of life an attention that this period well merits and which has resulted in his having a better idea than most pediatrists as to the proper handling of the newborn. While in matters of detail we may not all agree with his views, yet we must commend most heartily both his philosophy and his method of procedure. Dr. Pritchard emphasizes the impropriety of the care of the newborn by the obstetrician, whose greatest interest is naturally with the mother and whose appreciation of the problems of the infant is, as a general rule, less keen than that of the pediatrist. Particularly does he condemn the early "fatal" dose of castor oil, so commonly given, and the practice of overfeeding and too early feeding with cow's milk, which so often upset the infant and make the pediatrist's task when he is called in much more difficult.

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